



Basics of Clay

Pottery activities include exposure to dust, chemicals, fumes and intense heat. There are also manual handling risks and risks to the drains. Anyone working with clay at the shed needs to be familiar with these risks. Everyone who participates in clay activities at the shed must go through a basic induction – this includes reading this document in full. **No-one should operate machinery including wheels or kilns unless they have had training. At the Coolum Women's Shed we offer two types of activity:**

Mud Meetup – is a regular chance to play with clay in a social setting. A small amount of clay is available to use or you can bring your own. You can also use the wheels at the shed if you have experience. **For inspiration check the handouts at the end of this document, or some of the online resources listed.**

Workshops – offer a specific product or skill. These will vary depending on volunteer availability. Nell offers 1-to-1 wheel throwing lessons which specifically fund pottery resources. (\$100 or a 2 person session for \$150)- please email us about availability as these are run 'on-demand'.

Life Cycle of Clay



NB Clay can be reused as long as it has not been through the kiln. It just needs to be rehydrated and wedged. **Do not put clay water down drains, do not rinse clay equipment in sink.** Use 2 buckets – one for slops, and one to rinse. Use a separate bucket for general cleaning to avoid contamination of clay with other dirt. Clay is best stored in a sealed bag, in a dark space (A small esky makes an excellent clay storage device.).

Types of Clay

There are lots of types of clay, but for hobby potters we usually consider Earthenware vs Midfire Stoneware vs Highfire Stoneware.

The clay you use determines the firing cycle and what glazes you can use. If you don't know, they won't fire correctly- glazes may run off the pot or have other unwanted effects.

Name	Firing Temps (celsius)	Orton Cones (heatwork)	Uses
Earthenware. Traditional clay.	950 - 1150		Outdoor pots especially terracotta which is a specific type of earthenware. Bricks. May or may not hold water so uses vary. Cheaper to fire. Glazes are pigment based rather than chemical reactions – what you see is what you get.
Midfire Stoneware	1100-1220	5 or 6 – aim for 6	Crockery, jewellery, sculptures, decorative. Very popular with hobby potters due to the wide range of FOOD SAFE ready made glazes and the option to create functional and well as decorative items.
Hi-fire Stoneware	1220-1280	6-9	Used more by production potters, and woodfired potters – can withstand high temps, can be stronger, more exciting glaze options as chemical reactions create melt and transition e.g. crystalline glazes.
Porcelain	1250 - 1400	10-12	Fine tableware, ornaments. Hard to work with, expensive to fire (due to electricity required to get to high temps). NB you can now find 'midfire porcelains' which can be fired to cone 5 or 6.

At the Coolum Women's Shed we aim to use Midfire Stoneware clays that fire to cone 5 or 6 – 1100-1220.

If you want to buy your own clay, clays that work well at this temperature include:

- Keanes Mid fire no.6 (Smooth white clay)
- Feeneys Dark Stoneware (Smooth dark clay)
- Feeneys BRT (strong with lots of 'grog' – interesting colour and texture)
- Keanes Mid fire Lumina (Very fine, very white)

When working with different clay, please try to keep any clean up or recycling separate to avoid cross contamination (although this clay can still be used if it does happen – just keep it labelled).

YOU MUST KNOW WHAT TYPE OF CLAY AND/OR GLAZES YOU ARE FIRING OR YOU CAN DAMAGE THE KILN, YOUR WORK OR OTHER PEOPLES WORK. For example – if you fired earthenware or midfire clay in a high fire firing your piece could melt and damage the kiln shelf or someone else's work. **If you put the wrong clay into the kiln and cause damage you will be liable for any repair or replacement costs.** This is why it is better to work with just one firing range in a community studio. Only experienced potters are able to work with different clays and firing schedules.

Disposal/recycling clay

Community studios tend to have their own clay and glaze disposal processes – check before you use them. You can also pour all your slops onto a large plaster bat. The 'two bucket' method works as a DIY method and can be done at home. The two bucket method reduces the time to get the clay back into a workable state, it's similar to washing really dirty dishes:

- Any clay that is still in a useable state can go straight back into the bag.
- 'Dirty bucket' – first wash with a cloth, scrape any lumps etc off
- 'Rinse bucket' - rinse off dirty water.
- If you keep your hands clean, and don't contaminate the buckets the dirty bucket when full can be left to settle, and wedged again to make useable clay*. The Rinse bucket eventually becomes the 'dirty bucket'.

*It's tempting to pour off excess water, but it's better to wait for the water to evaporate if you can – some potters believe smaller clay particles are lost when you pour out water. If it's really clear and well settled it won't do too much harm and helps speed the process of reclaim.

It's also possible to buy a slop bag which is a nylon liner for a bucket and you pour everything in, but the water comes out. (for sale at the clay shed). Pillow cases also work in a similar way – the cotton can rot eventually.

Use a similar method for cleaning up glaze, but keep glaze and clay reclaim separate.

Types of Glaze

Underglaze- stained pigment that can be used like paint to create designs. Watered down it can produce watercolour type effects, or stronger can be used for bolder effects. Underglaze does not provide a glassy finish on its own. Some people use a clear glaze over a design, but it may run in the kiln.

Mineral pigments - these are pre-fired minerals which can be used to stain clear or white base glaze. They can also be used to add colour to clay and slip. What you see is what you get, so can be useful if you want to produce a specific look.

Premixed – easier to use for beginners, but more expensive. These are standardised recipes that you can choose for their hue and finish. A lot of fun! You can also choose lead free glazes (recommended). It is important to pay attention to the type of clay and firing temp.

Studio mixed glaze. It is possible to buy the ingredients for making your own glaze. Usually a glaze will have a clear or opaque finish and you may choose different minerals to add colour (e.g. cobalt gives blue). Studio mixed glazes can be a lot of fun, but you must know what you are working with, and observe health and safety protocols when working with ingredients. i.e. Wet clean up, avoid dust, safe disposal, avoid eating or drinking near glaze materials.

Mineral wash. Not really a glaze, but a wash made with iron oxide mixed in water can be used to accentuate textures or draw.

The main ingredient of glaze is clay, and it is basically powders mixed with water to provide the right consistency. If your glaze has dried out or is looking too thick to apply, try adding back some water.

Disposal of glaze. The best way to dispose of glaze is to keep a 'mystery glaze bucket'. Rinse glaze materials into the bucket and let the bucket evaporate. When you have an item which would never have food on it, you can try out the mystery glaze and see what you get. Do not tip glaze down a drain. If you have a lot of glaze waste, you can have more buckets – dark, light, warm (red/yellow) and cold (blue/green) are good options.

Sunshine Coast Pottery facilities and resources

The Clay Den – pottery club in Coolum on Tradewinds Avenue. Supportive, many talented members. Has a waiting list to join. Has tools, wheels and regular kiln firings.

The Clay Shed – Kuluin. Only pottery supplies on the Sunshine Coast. Supplies clay, ready made glazes, glaze ingredients, tools – anything you might need. The Clay Shed also **offers a firing service** – based on the weight /size of the pieces being fired. Make sure you know what type of clay and glaze you are firing to avoid damaging your work or anyone elses.

The Butter Factory Cooroy – Offers a variety of classes and studio options. Lots of wheels and large kilns.

Sunshine Coast Arts Group, Buderim – Offers a variety of classes and studio options. Lots of wheels and large kilns.

Wallace House - Noosa Arts and Crafts Association- has community pottery open to members. Sometimes offers pottery classes.

Dennis Forshaw – Doonan, offers wheel throwing classes, also is an expert in gas firing and reduction crystalline glazes

Fiona Cuthbert O'Meara – Doonan, offers pottery classes in a beautiful home based studio. 6 wheels, small classes.

Brianne - handbuilt pottery classes. Maroochydore

Quixotica – beautiful studio in the hills of Cooroy. Rowley Drysdale offers weekend courses and day workshops – great experience and location.

Nambour TAFE – for part and full time tertiary courses.

Risks of working with clay

Exposure to silica and other minerals

Silicosis – the dust in clay is known to cause silicosis – there is no cure. This is why it's important for you to avoid breathing dust and keep the studio clean.

Other Mineral Toxicity – common minerals used in pottery include : copper, aluminium, chrome, iron, manganese, cobalt, zinc, tin. Avoid making dust where possible, work in a well ventilated area, do not dispose of chemicals down domestic drains. Ensure containers are kept sealed and are well labelled. Avoid skin contact.

Use a **damp cloth and bucket to wipe down surfaces and equipment after use**. The water can be left to settle and added back to clay store. (Do not use the same cloth for general cleaning if you can – this prevents mold and other nasties in the reclaim)

All equipment must be cleaned with a wet cloth after use – do not leave to dry with clay on.

Use a mop or hose to clean floors

NEVER brush or vacuum clay or glaze dust

NEVER dispose of clay or glaze down drains – clay will 'settle' in water and can be reused.

ALWAYS shower and wash your hair after working with clay or glaze

AVOID dried on clay – for example do not keep clothes or cloths between sessions – always rinse out and hang to dry or rinse out and then put through a washing machine.

If working at home, AVOID working in areas which are difficult to clean with water e.g. near sofas, cushions, curtains or carpets.

Keep all minerals in LIDDED containers.

Greenware (unfired clay) should be STORED away from general work area – preferably outside but protected from the elements.

Exposure to mold and other bacteria

Clay is a natural petri dish – **always wash your hands with soap and water before handling clay** to minimise the amount of bacteria and mold that it is exposed to. The general consensus amongst potters is that black/green mold is ok, and can be wedged (kneaded) back into the clay. However it is good practice to to minimise exposure in the first place.

Manual handling risks

Clay and equipment can be **heavy. Do not lift or move items that may be too heavy for you**. Use a trolley or ask someone else to help. Do not stack heavy items on high shelves. Do not load a kiln without basic training on how to stack pieces appropriately.

Injury from using equipment – sharp objects, rotating machinery. Proper induction on any machinery. Closed shoes recommended. Hair, and necklaces tied back. Recommend removal of rings and short nails.

People with **hand, wrist, elbow or shoulder impairments** may find clay work easier if they use softer clay. Just add more water to the clay.

Exposure to heat

Never open a kiln unless you are sure that the temperature is below 200 c. Thermal shock can cause pieces in the kiln to explode if the kiln is opened whilst too hot. Treat pottery from a kiln like you would treat items coming out of the oven – always use appropriate gloves. Do not operate a kiln without an experienced kiln technician.

Be good to other sheddies

We share the studio space – please help with the clean up before leaving for the day. Even if you have to go early, please check with others to see what you can do to help. We aren't your mum 😊

Further information

Check out these online resources

Facebook: Tim See beginner wheel throwing, DIY Pottery Tools

Youtube: Simon Leach, John Britt, KarensPotsandGlass, Jonthepotter

TV shows: The great pottery throwdown

Respected brands (keep an eye on second hand market)

Venco wheels

Shimpo Wheels

Woodrow Kilns

Stutt Kilns

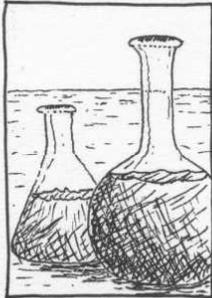
WHAT IS CLAY?



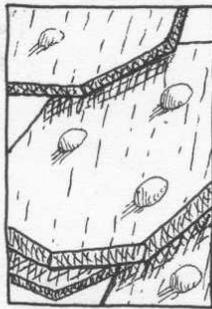
Clay is a product from the earth that when heated becomes hard..



Geologically, clay comes from decomposed rock. It is typically carried by water and settles together in a particular area where it is mined.



Chemically, clay is a combination of Alumina, Silica, and water:
$$\text{Al}_2\text{O}_3 \cdot \text{SiO}_2 \cdot 2\text{H}_2\text{O}$$
along with other minerals.

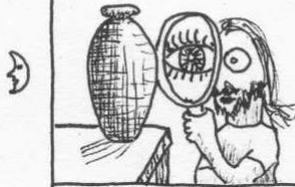


Physically, clay's crystal structure is that of tiny sheets with water between them. The sheets are held together by suction but can slide past each other like a deck of wet playing cards.



Heat causes the clay to harden. At 600°C the water is driven off and leaves a bonded alumina silicate structure. Further heat, 800°C , causes melting of the free silica and other materials into a vitrified, or glass like, substance.

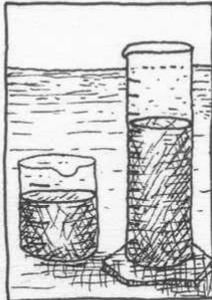
WHAT IS GLAZE?



A glaze is a glassy surface covering. It makes the pot waterproof and adds decoration.



Geologically, the major components of a glaze come from the same place as clay. However, some of the lesser materials may be mined from a variety of sources.



Chemically, you'll find 3 major compounds in a glaze: Silica, Alumina, and a Flux. These occur in various proportions along with other substances that give color.



Heat causes the glaze ingredients to melt and form a glass. The Silica melts to a glass. The Flux allows the silica to melt at a lower temperature. The Alumina keeps the molten glass from flowing off the pot.



The look of the glaze, its color and opacity, depend on the proportion of the 3 main ingredients, the additional colorants, and the firing of the kiln.

WHAT IS A FIRING?



Firing is the process of adding heat to the ceramic material



There are a variety of ways to heat clay. They include a simple campfire, wood kilns, gas kilns, electric kilns and experimental solar kilns.



The atmosphere of the kiln helps dictate the color of the clay and glaze. An abundance of oxygen, oxidation, creates clear, bright colors. A lack of oxygen, reduction, gives warm browns and reds.



Generally, there are two firings. The first, bisque, drives the water from the clay so it may easily be glazed. The second, glaze firing, heats the clay to its particular vitrification temperature.



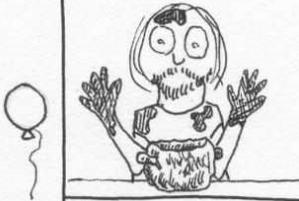
Cones, "Δ", are a common method of measuring the temperature inside the kiln. They are made of ceramic materials which melt at known temperatures.

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CONE	°C	°F	COLOR	WHAT IS GOING ON?
Δ016	792°	1458°	Dull Red	Organic matter burns off.
Δ06	999°	1830°	Orange	Bisque, Lowfire, Terracotta
Δ3	1168°	2167°	Yellow	Commercial Toilets and Sinks
Δ10	1305°	2381°	Bright Yellow	Highfire, Dinnerware

PINCH VESSEL

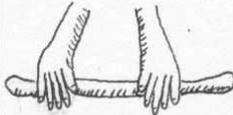


With the pinch vessel we will explore the immediate possibilities of clay.

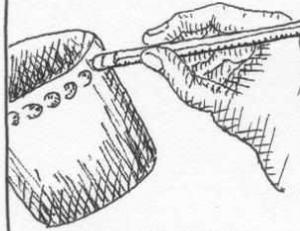
CLAY CAN BE...



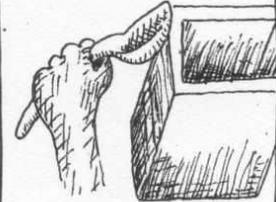
SQUISHED



ROLLED

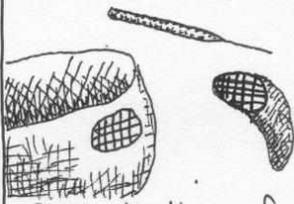


STAMPED

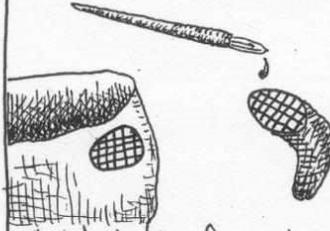


SMOOTHED

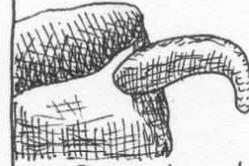
To join two pieces:



Score both surfaces



Add lot's of water



Press together

Project: We will be making small reliquaries. Reliquaries are containers for sacred or special objects. Sketch out five ideas in your note book. Our reliquaries will be fired in the Raku kiln. Please make two reliquaries each no larger than 4" x 4" x 4".

AESTHETICS

Pinch techniques are an expressive way to handle clay. They can be used crudely or with refinement. One can see the marks of the maker. The artist's emotions may be easily conveyed.

Reliquaries often attempt to show the importance and meaning of their contents.

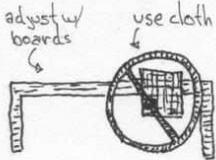


SOFT SLAB

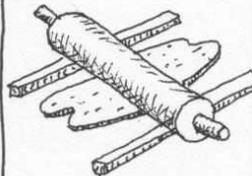


Soft slabs will allow us to carefully design and construct utilitarian objects.

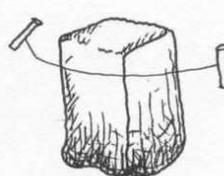
TO CREATE A SLAB....



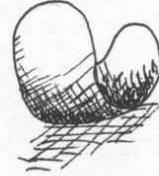
With a roller



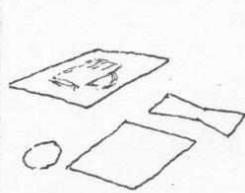
Rolling pin & slats



Cut from block



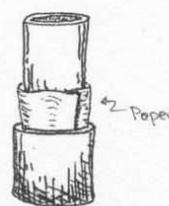
Or stretch by flip



Design Cut out pattern



Cut clay with knife



Construct with form



Use slip to join

Projects: Design and construct a set of four mugs. Please consider these as items for household use. They must be pleasing in design, well crafted, and comfortable to use. They are also considered a set. Sketch out five different styles in your note book and choose one to work from.

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AESTHETICS



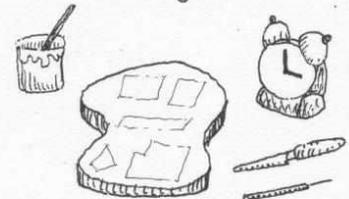
Soft slab techniques enable the artist to create smooth curves, bends, folds, and edges. With slip, finely executed joints and attachments may be accomplished. Careful planning for minimum of handling will produce a clean form.

HARD SLAB



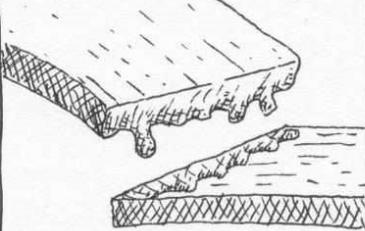
Hard slabs give one the opportunity to make forms with sharp corners and flat sides.

Create enough slab



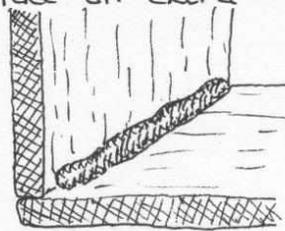
and let dry until leather hard

Score and Slip



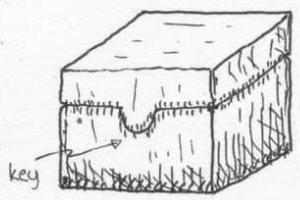
to join parts

Place an extra



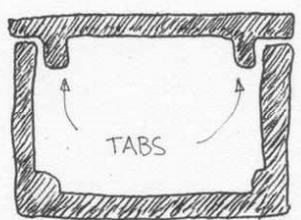
bead of clay on the joint

LID I



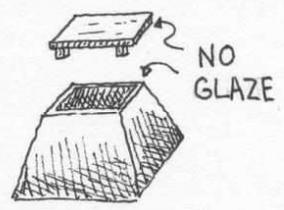
Closed form & cut

LID II



Cut away view

GLAZE ALERT!

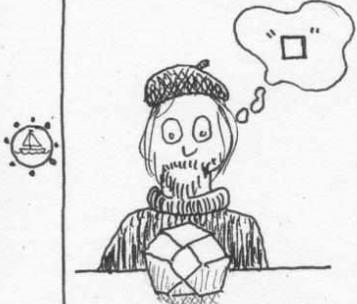


Don't glaze shut.

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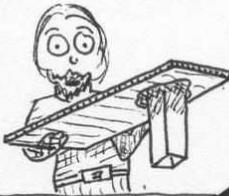
Project: Construct two lidded containers using hard slabs. One must have three corners that are not right angles, 90°. Sketch four designs in note book.

AESTHETICS



Hard slabs enable one to make geometric shapes. They also present large flat surfaces for decoration. Because they can be self supporting, complex forms can be created.

GLAZES

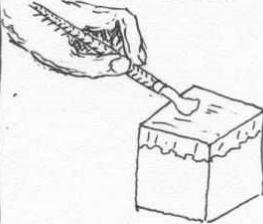


Glazes may be applied many ways - as long as the glaze will not melt onto the kiln shelf.



Toxic chemicals
Do Not eat or drink here

Use wax



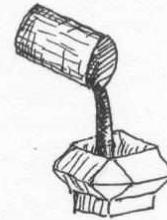
To keep glaze $\frac{1}{4}$ " from the bottom of piece

Glaze settles



So stir with a stick

Pour the inside



and quickly pour out



Now try...



Dipping.



Brushing



Spraying



Sponging

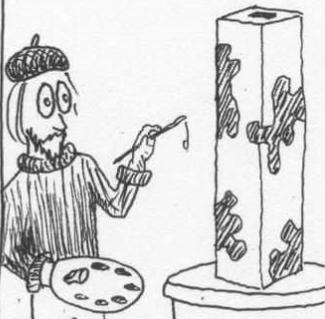
CLEAN
THE



FOOT

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AESTHETICS



Match the glaze to the surfaces of the clay piece.

Try different combinations - and record them in your notebook!

Keep looking at pieces coming out of the kiln for ideas.

COIL HEADS

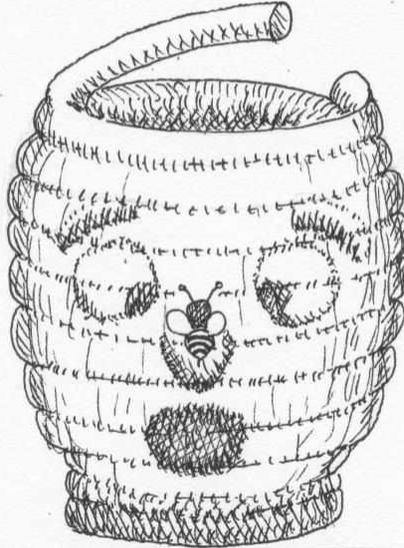


Coil method can be used to form large pieces.

Roll out coils

Score, slip, & knit together

Build up slowly a few layers at a time.



Moisture control is critical



Projects Using the coil method make a head at least 15" high and 10" at its widest. It is to depict a particular emotion or state of mind. Sketch 3 faces in your notebook.

AESTHETICS



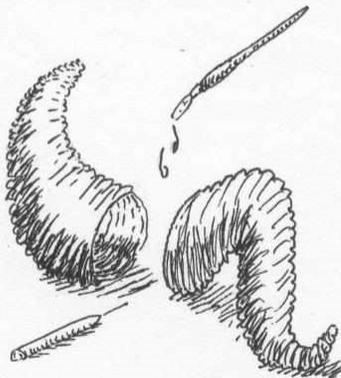
Large forms give one an opportunity to explore surfaces. The coil method leaves marks but other textures like carving, stamping & burnishing may be tried. Use a mirror or a friend to study the emotion you want. Notice the shape of the eyes, eyebrows, and mouth.

COIL SCULPTURE

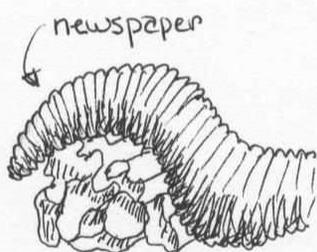


The coil method is a good way to make projections out into space.

Attach coiled parts

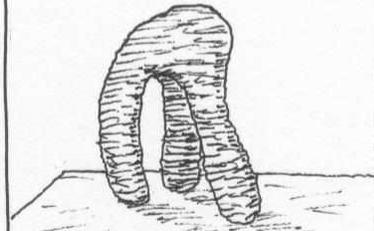


Use forms for



temporary support

Construct and fire



urnop apisdn

Project: Create a form with at least 3 appendages or projections. At least two of these must project into space. Sketch out 4 in your notebook.

AESTHETICS



The coil technique can easily create undulating cylinders and round shapes with soft features.

Learn to exploit this technique by exploring biomorphic forms like hands, trees, plants, sea life, and the like.

Consider the space around the piece and how your sculpture relates to it.

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MULTIMEDIA



While clay is a versatile material, other non-ceramic items may work better and may make for exciting juxtapositions.

Non-ceramic elements	Carefully plan	Take into account	leave plenty of time
<p>are included <u>after</u> firing</p>	<p>how it is to attach</p>	<p>shrinkage</p>	<p>to put together</p>

Project: Create a ceramic object that incorporates at least one major non-ceramic element in it. No glue is to be used to attach them together.

AESTHETICS



Non-ceramic elements ought to relate in an interesting manner to the clay. Consider color, texture, shape, and size.

The method of attachment is important, for one's attention is immediately drawn to it. Objects can be bought, found, or specifically made for the piece.