LOW TEMPERATURE CASTING PROJECT OUTLINE NO1

A JEWELLERY SET FROM CUTTLEFISH BONE

THE TASK:

To understand the processes used in casting in order to create a three-dimensional component that could not be produced using other methods of manufacture.

LEARNING OBJECTIVES

- To understand the processes involved in the production of a small object cast in metal.
- To be in a position to go from initial design to the finished manufactured product.
- To develop an understanding of the use of a low melt metal (Pewter) as a design material.
- To observe safety aspects required for a practical activity in the classroom.

PRE-LESSON PREP (PREVIOUS WEEK)

- Explain the project - making references to what they will know, understand and be able to do by the end of the project.
- Give a clear indication of the level of capability the core will be working at, explaining that you will be providing some pupils with extension work at a higher level of capability.
- Look at the LT1 and explain its purpose, making reference to any possible design constraints.
- Show examples of designs that they might develop with examples of designs already cast.

Cuttlefish bone is the bone of a cuttlefish, a fish related to the squid and Octopus. The bone is easy to carve and is very porous making it ideal for casting as the displaced air within the mould at the time of pouring is expelled through the capillaries of the bone. The negative side is that every mark is transferred to the cast so great care must be taken when carving out the mould.

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THE LESSON:

Using jewellery as inspiration for design, young pupils were asked to investigate one of three aspects of their locality: A building, a person, and a place.

As an example one pupil, through research into her family, discovered that a distant ancestor Sir John Blackett fought at the battle of Agincourt in Northern France.

Her investigation of her ancestor and the battle produced cross curricular information related to: History: The Battle of Agincourt and the 100 Years War and Geography: The Nord Pas du Calais region of France.

PRE- MATERIAL & EQUIPMENT PREP:

Split the cuttlefish bone lengthways using a band saw and prepare LT1 (If you do not have the facility to split the cuttlefish bone, ask your local secondary school if they can help.)

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Splitting the cuttlefish in this way creates a matching surface which when brought together for casting is less likely to leak hot metal.

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The design inspiration:

1. Tracing of prepared designs on to cuttlefish bone. Trace the design, then using a needle prick around the trace. Place the trace on to the cuttlefish and dust with charcoal. Remove the trace to show the outline of the design on the cuttlefish. (note: using a pencil trace can damage the cuttlefish surface).

2. Carving out the design into one side of the cuttlefish to produce a mould. The cuttlefish is very soft and carves easily. Every mark is transferred to the cast so care must be taken in ensuring that the surface reflects the required pattern of the design.

3. Adding sprue hole to mould. Angle Sprue hole of 8-10 mm to make a "pouring funnel" for the metal. No requirement for a vent as the cuttlefish bone is porous.

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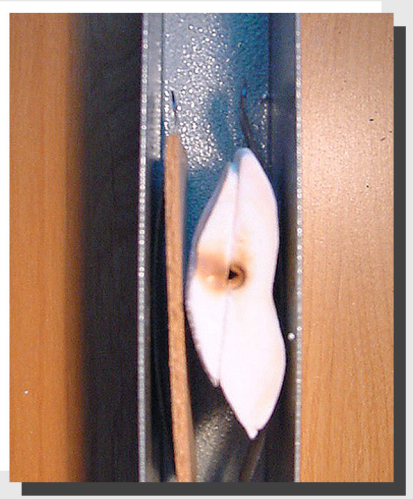
4. Casting into a Cuttlefish mould using the Flamefast LTI. Lay out the cuttlefish halves and the packing and clamps for placement into the shuttle.

5. Flamefast LTI shuttle. The LT1shuttle with the cuttlefish mould clamped in position ready for insertion into the pouring channel of the LT1.



6. Final Cast Eagle. The Eagle after casting, cooling and careful removal from the mould. The eagle can now be cleaned up and polished.

7. The Finished Eagle. A ring is soft soldered to the double eagle head and a chain attached to the ring.