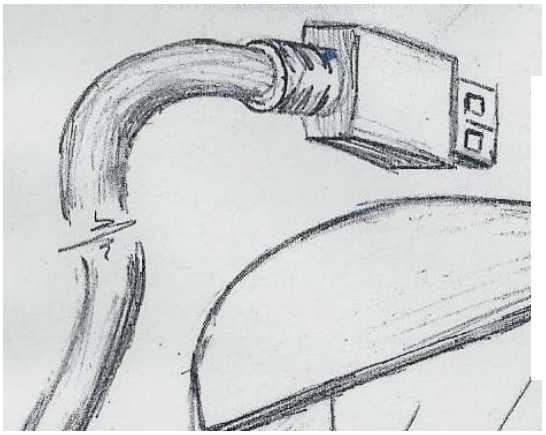
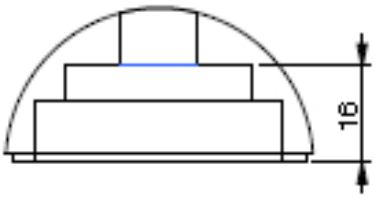
Sheffield Hallam University

DipHE Subject Knowledge Enhancement (SKE) course in Design and Technology Education

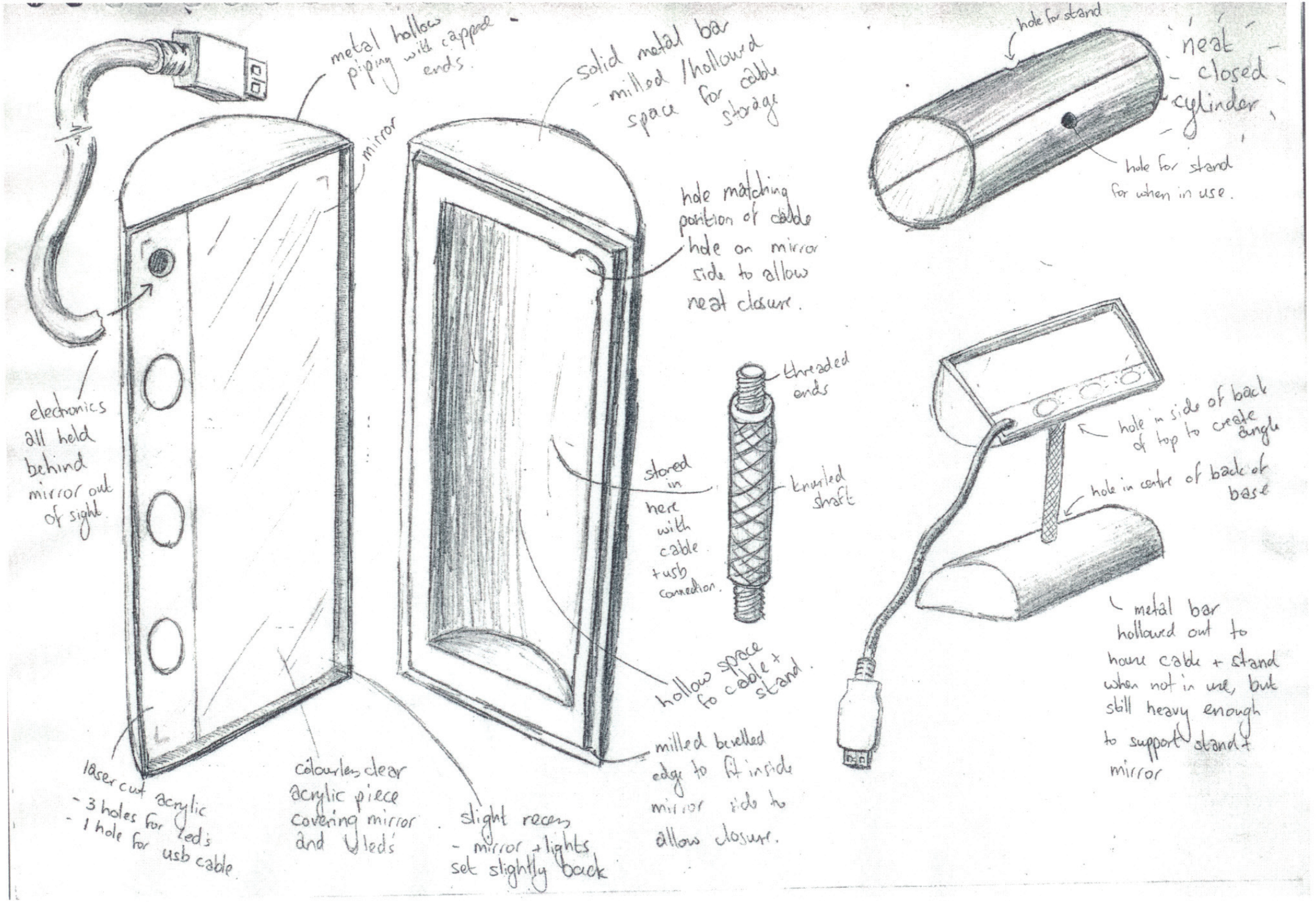
Design and Manufacture Studies

Learning-Log for USB Desk Lamp



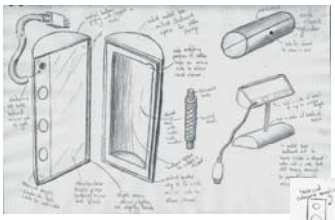
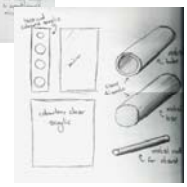
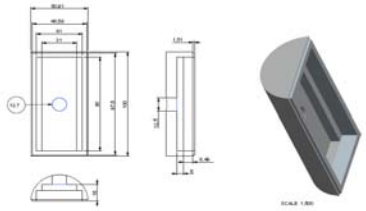


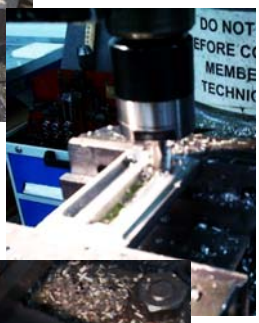
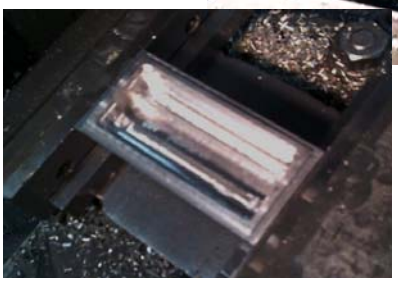
Alexandra Sperr

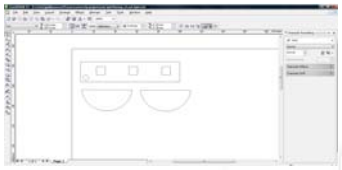


Design sketches for usb light

Alix Sperr

Date	Learning Outcomes	Evidence
09/01/2012	Design brief given, ideas drawn. Concept drawing sketched and annotated with thought to the original design brief. Consideration of appropriate materials to use for manufacturing; and to how to incorporate knurling, milling, turning and threading into the finished piece.	   
16/01/2012	Using Creo Elements Pro to develop the design into 3D	 
18/01/2012	Creating engineering drawings to follow during manufacturing, using a feature in Creo Elements to convert the 3D images into working drawings	
23/01/2012	Using a metal turning lathe to manufacture the stand #1 With the bar still held in the lathe, a tap is added to allow the piece to be screwed into the top and base	 

25/01/2012	After using a milling machine to drill a hole into the side of the metal tube, it is held in a vice and cut in half lengthways using a hacksaw	
25/01/2012	The rough edges of the half-pipe are milled down to make a smooth and flat edge, exactly one half of the original size of the tube	
30/01/2012	A section of metal bar is milled down to slightly more than half-way through using a slot drill inserted into a milling machine. This is an extremely long process, as only about half a millimeter is removed at a time in order to give a good finish and to stay in control of how mush is removed. The flat-milled section is then routered around the edges, and milled out on the inside to create a hollow. This is also a long process as extra care must be taken not to mill straight through the back of the bar. Coolant is continually poured into the milled trench to prevent the drill from smoking and the swarf from sticking to the drill bit	  
01/02/2012	Stand #2 is manufactured using the metal turning lathe. The design was modified along the way in order to avoid having to use screws and bolts to keep the finished piece together. Threading is added to both ends, and knurling is added to the shaft for grip when putting the pieces together.	

01/02/2012	The finished pieces are sandblasted to give an even finish. (this isnt me using the sandblaster, but you get the idea)	 
02/02/2012	The acrylic parts of the object are drawn in CorelDraw, and a laser cutting machine is used to cut out the end pieces of the tube, and the surround for the usb light circuit board.	 
02/02/2012	The usb cable is soldered onto the light board, the mirror is cut to size and the whole piece is assembled	 

	Project Evaluation	
03/02/2012	Im pleased with the finished product but have recognised several areas that could be improved. The stand doesn't quite sit flush with the top or the base, and a small area around the holes could have been milled to account for this. Although the lid fits, there is no mechanism for keeping it closed - slightly tighter engineering to ensure the lid stayed on under tension might be a solution. The milled out trench in the base could do with being "cleaned up" a bit to remove rough edges and make symmetrical, though this would require a great deal of practice using the milling machine.	  
	Overall however, I am pleased with my first metal project, and feel that I have done extremely well considering the pressures of getting time in the workshop and finding help in setting up and operating the machines. I think the product is very similar to my original design concept, although a few slight changes were made along the way once i gained more experience in using the machines, and learned what they were and weren't capable of. The main modification is of teh shape of the trench milled out of the base, due to restrictions of the machinary, material and operator.