

Junior Certificate Technology

Higher Level

Design Folio

Year

20XX

Design Task

C

Examination Number

124401

School Roll Number

54271H

Note:

The content layout in this exemplar design folio follow the headings as outlined in the Technology Design Tasks document (SEC Ref . S.67).

Design Task

Aromatherapy has become popular in recent years.

Design and make a unit of aesthetic proportions that will diffuse aromas by means of a motorised fan.

(Note: The fan must be safely housed and controlled.)

Analysis of chosen task

The following are important requirements based on analysis of the given design task.

- An aromatherapy unit must be designed and made.
- The unit must be aesthetically proportioned.
- The unit must diffuse aromas by use of a motorised fan.
- The fan must be safely housed and controlled.

Design Task Specifications

In order to satisfy the design task requirements the following design specifications are required.

- I must design and manufacture an aromatherapy unit
- The unit must have a facility to hold the aroma products
- I must include a motorised fan to diffuse the aromas
- I must use materials which are suitable for an aromatherapy unit
- The unit must be well assembled, with a high quality of finish suitable for presentation
- The unit must be attractive and aesthetically pleasing
- The unit must be safe to use with no sharp edges
- The fan must be safely housed so as not pose a danger when in use
All wires and components must also be neatly housed
- All important components must be accessible e.g. battery etc.
- The chosen task must be completed within the given time frame – 30th April.

Research and Investigation

To help form possible design ideas to meet the design task requirements, I carried out my research using a number of different sources.

These included:

- The Internet
- Examining similar products available in local shops and at home
- Technology school book and notes
- Discussion with others in relation to any ideas or possible solutions they might have.

Using *Wikipedia* I discovered that aromatherapy “...is a form of alternative medicine that uses plant oils and other aromatic compounds for the purpose of improving a person’s mood, cognitive function or health.”

I also found out that aromatherapy has been in use for hundreds of years in which aromatics have been used to influence how a person feels emotionally. Aromatherapy has also been used to help cure some physical conditions such as colds and sinusitis.

I discovered that the modes of application of aromatherapy include:

- Aerial diffusion – using hot or cool air dispersion method
- Direct inhalation
- Direct application to the skin.

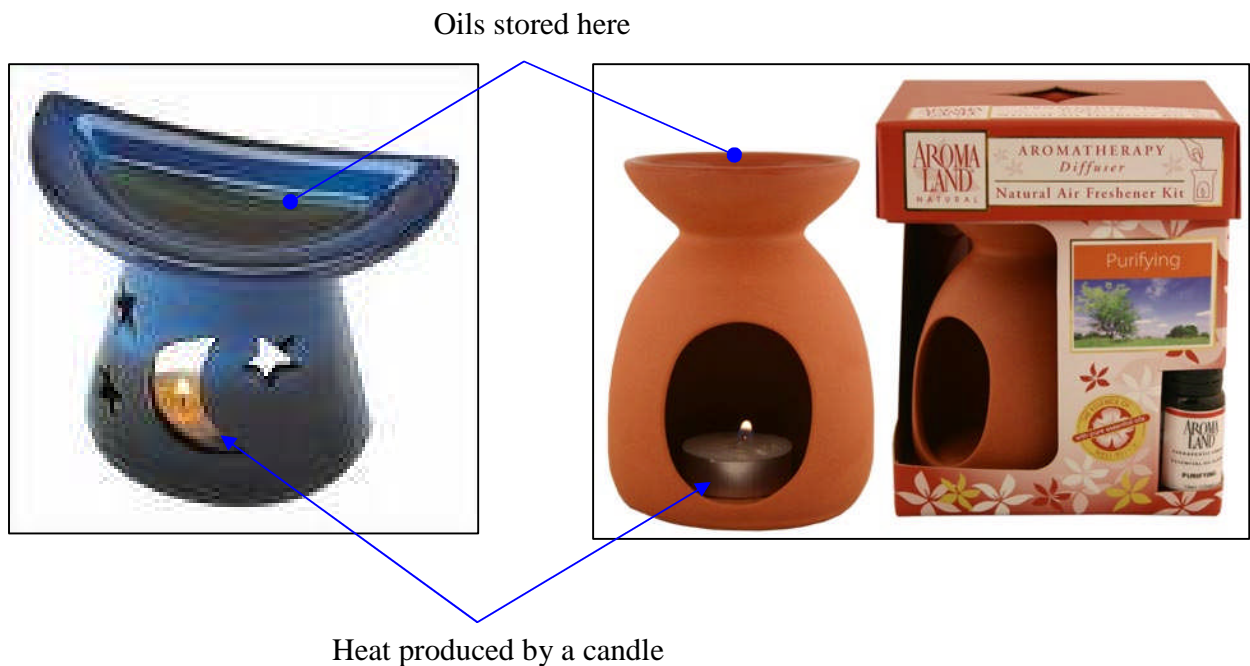
Based on this information I decided to look for possible existing solutions in **local shops** that sell aromatherapy products.

I found that a very common way of using aromatherapy oils is to add a few drops' of oil to water which is contained in an **ornamental bowl**. A night light candle can be placed underneath to heat the oil and water. This helps to diffuse the aromas into the air.

The following is an example of such a product which is used in my **own home**.



Using **Google images** I found many examples of similar aromatherapy units to the one above. These are shown below.



My solution, based on the given design brief, needs to disperse the aromas by use of a fan. Therefore I used **Google images** to investigate different types of aromatherapy units that might use this method of dispersion.

The following examples were found:



Variable speed control



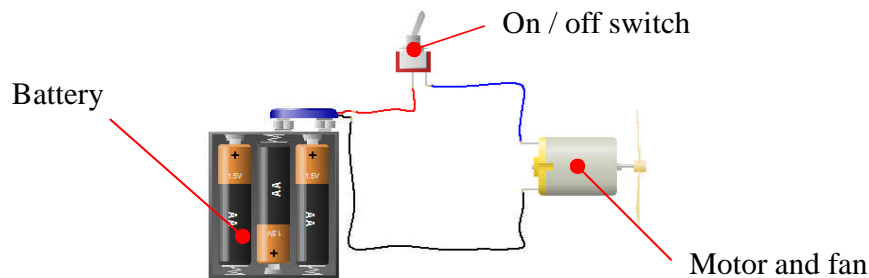
On / Off switch

In each of the aromatherapy units a heating element is used to vaporise aromatherapy oils which have been added to water. An internal fan is then used to disperse the aromas.

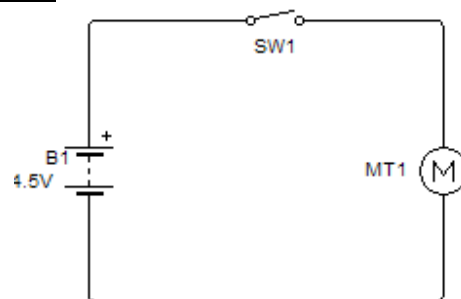
Safety is an important element of both of these designs with all components neatly housed within the units.

Control system research

The design solution must diffuse aromas by means of a motorised fan. The following is a typical motorised system which includes a battery, on/off switch and a motor and fan.



Circuit diagram



Motors

There are different types of motor available. However it is important that the motor chosen has a suitable torque and does not rotate too quickly. This is important from a safety point of view. It also reduces the noise output.

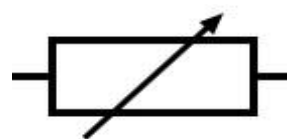


High torque motor
(9600rpm @ 3v)



Medium torque motor
(3000 rpm @ 1.5v)

The possibility of using a variable resistor to control the speed of the motor could also be considered.



Variable resistor & symbol

Summary of Research findings

From my investigations I found:

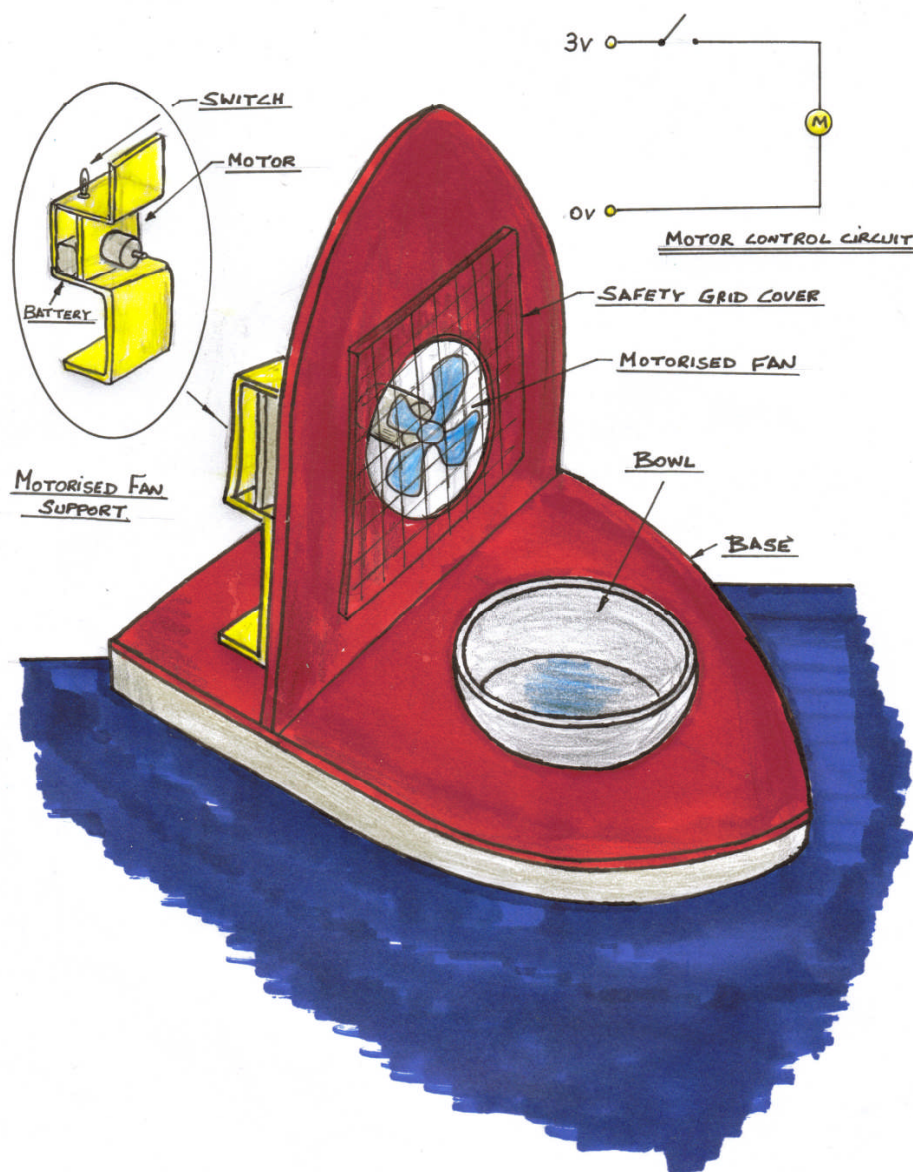
- Aromatherapy has been used for hundreds of years as a form of alternative medicine
- Aerial dispersion is commonly used to disperse aromas
- Aerial dispersion can be achieved by vaporisation with or without the use of a heat source
- A fan can be used to aid the dispersion of aromas
- A simple motorised system can be used to operate a fan
- Correct material choice is important:
 - (i) For safety, if a heat source is being used to help vaporise the aromatherapy oils
 - (ii) To prevent leaks and spills if an oil is used.
- Appropriate material choice is an important consideration in the context of presentation.

Development of ideas

Idea 1

In this idea hot water is poured into the bowl and a few drops of aromatherapy oil are then added.

The oil slowly vaporises and the motorised fan disperses the aromas around the room.

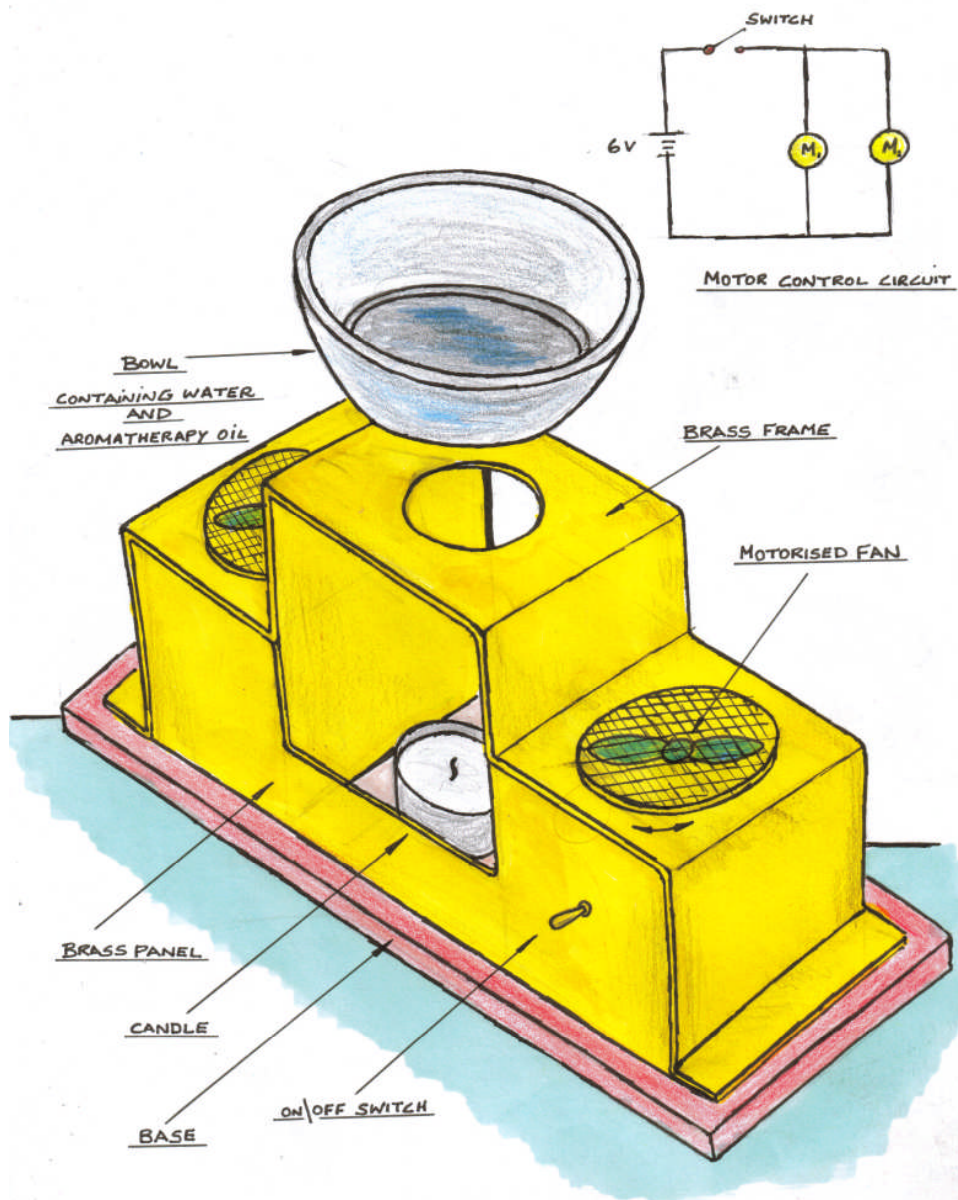


Idea 2

In this idea, brass is chosen so that a night light candle can be used without the risk of the material being a fire hazard.

When the candle is lit the water and aromatherapy oil mixture heats up and slowly vaporises.

A motorised fan at both sides helps to disperse the aromas around the room.



Selection and justification of final solution

Idea 1 - Final solution

This is my chosen solution as it meets all the design specifications.

The unit is well proportioned and aesthetically pleasing to look at.

The unit is well balanced with a wide base to prevent it toppling over.

The base is wide enough to support the bowl into which the aromatherapy oils are placed.

The motor and fan are safely housed with the housing itself providing further support and stability to the unit.

Idea 2

This idea appears to satisfy the design specifications.

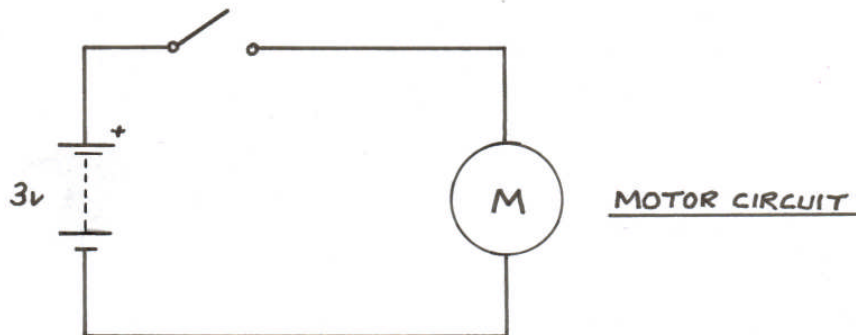
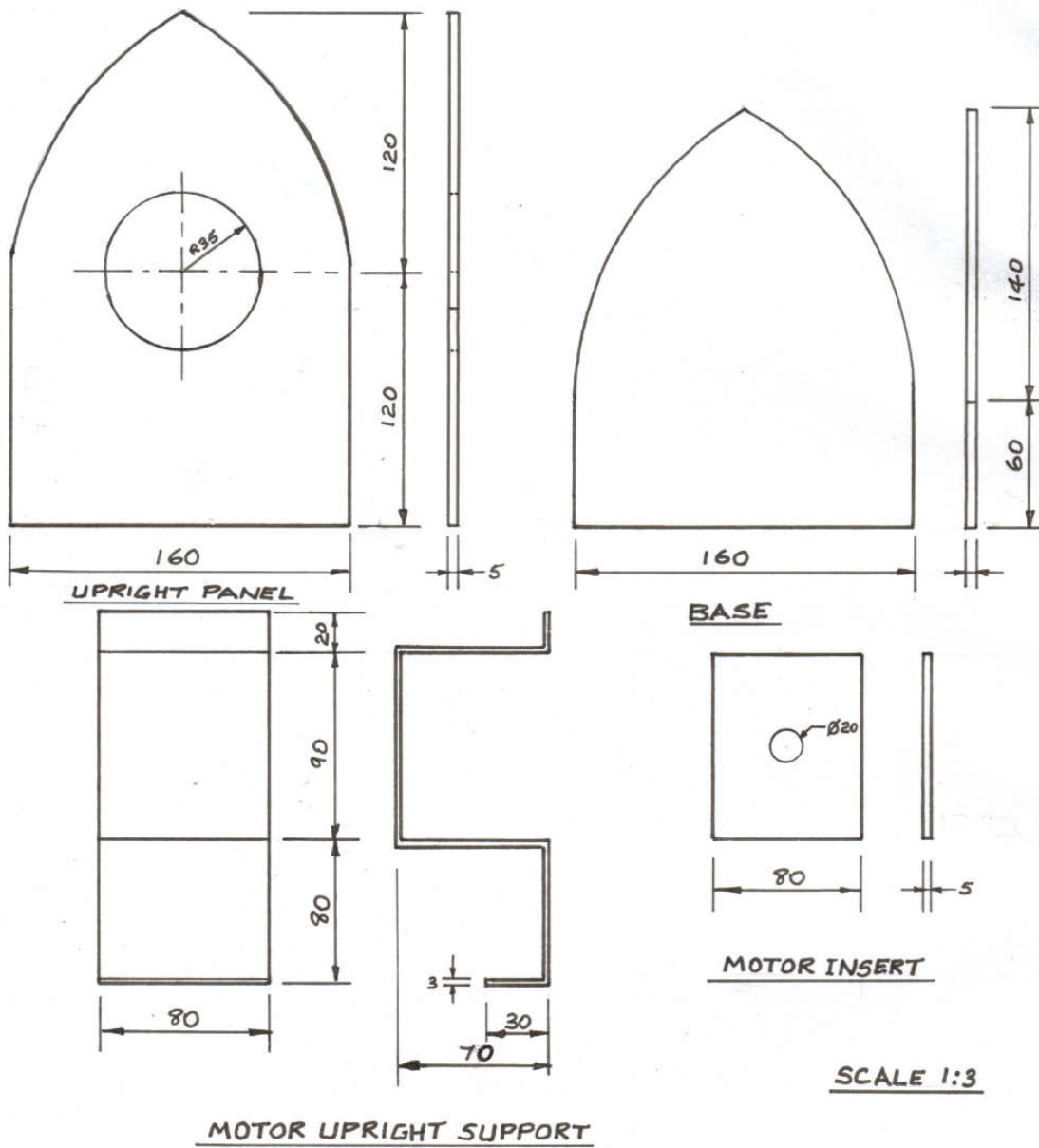
The brass could be bent easily using a folding bar.

However brass is a good heat conductor therefore poses a burn risk if touched when a night light candle is being used.

The use of a night light candle is also a safety concern due to the risk of fire if knocked over.

The fans at both sides may not directly disperse the aromas effectively as they are not directly in line with the bowl.

Manufacturing Drawings



Manufacturing Sequence

1. Mark out each part using the measurements specified in the working drawings.
2. Cut out each part using the scroll saw or jigsaw.
3. Cut the fan outlet hole in the upright panel using the scroll saw having first drilled a hole so that the blade can pass through.
4. Drill two Ø4mm holes in the lower part of the motor support and base so as to accommodate screws.
5. File and sand each part to a smooth finished size.
6. Using the strip heater bend the motor support to shape.
7. Drill a Ø7mm hole in the top section of the motor support for the switch.
8. Attach the rectangular motor insert using machine screws.
9. Attach the upright panel using glue and then fix the motor support in place against this panel and the base using glue and screws.
10. Assemble the motor control circuit by soldering.
11. Fix the motorised fan, switch and power supply in place.
12. Attach the fan guard using nuts and bolts.

Materials list and costing

Part	Material	Length (mm)	Width (mm)	Thickness (mm)	Number Req.	Cost
Base	Acrylic	200	160	5	1	€1.00
Wooden base	Plywood	200	160	15	1	€0.50
Upright panel	Acrylic	240	160	5	1	€1.00
Motor support	Acrylic	200	80	3	1	€0.80
Motor supp. insert	Acrylic	90	80	5	1	€0.10
					Total Cost	€3.40

Components list and costing

Item	Cost
Switch	€ 1.20
Motor	€ 1.98
Propellor	€ 1.45
Propellor guard	€ 1.80
Aromatherapy bowl	€ 1.00
Total Cost	€ 7.43

Total cost of Task

€10.83

Testing

When the aromatherapy unit was finished, it was tested to establish if it worked correctly.

- Hot water was poured into the bowl and a few drops of rose oil added. The oil began to vaporise and the aroma could be detected.
- I switched on the motorised fan and the aroma dispersed quickly over a much greater area.
- The safety guard offered protection from the rotating fan.
- The unit was sturdy, looked well and in proportion.



Finished aromatherapy unit

Evaluation

Having tested the aromatherapy unit, I am satisfied that it meets the design specifications outlined.

The aromatherapy unit operates well and disperses the aroma once the motorised fan is switched on.

The materials chosen were easy to work with, and added to the aesthetic appeal of the unit.

The unit is well finished with the fan safely housed.

The circuit is easily accessible from the back.

The cost of the unit was well within budget and finished on time.

If I were to manufacture this design solution again I would consider the following modifications:

- As an extra safety precaution I would cut out a disc in the base platform so that the bowl would sit in place more securely.
- I would include a variable resistor so that the speed of the fan could be changed. This would allow the aroma intensity to be varied when required.