

Freshen up your
Key Stage 3 with

Fragrant Freebies

Jenny Dein TEP teaching fellow at Sheffield Hallam University takes us on a tour of this wonderful new desktop project following the success of the Aromafan Millennium schools project from TEP. This is the first in a new series of '3D' projects that provide really low-cost exciting outcomes and serious design opportunities for students

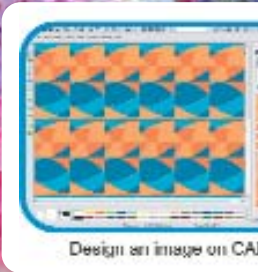
The 'Fragrant Freebie' is inspired from the overwhelming desire to fragrance the environment and the increasing trend for small discreet air fresheners on the market. These products not only eliminate or conceal 'pongs' but are also quite attractive artefacts

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This article is also available as a separate full colour PDF bulletin on the TEP website



Fragrant Freebies



Developing and delivering good CAD / CAM projects at Key Stage 3 is a task which most D&T teachers find difficult. Constraints such as cost, time and resources available can and do affect the delivery and consequently the pupil experience of CAD / CAM.

The 'Fragrant Freebie' is an example of a project which avoids many of those constraints and engages pupils through the design and manufacture of an interesting high quality easily produced product. The focus of the project is to use both CAD and CAM to develop a prototype air freshener that can be individually personalised for use in a number of contexts. Lifestyle situations including school, travel, sport and home are easily assimilated by pupils and using 'Nature' as a suitable source for design inspiration. The product could be given away free to promote the launch of a new range of fragrant products. This project works well at a number of levels with product analysis, research, modelling and prototyping easily undertaken with groups and individuals.

Aromatic Analysis

The market is saturated with a variety of inexpensive air fresheners, easily acquired for class use which pupils can investigate and analyse as an introduction to the project.



Examples of Air Fresheners on the market today

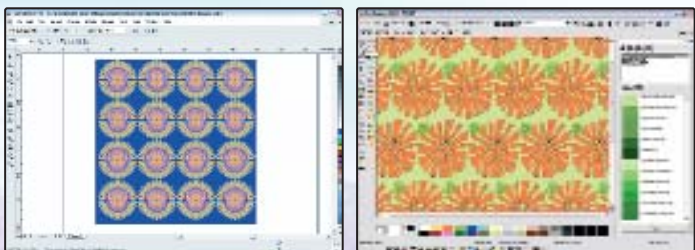
CAD Designs

Housing

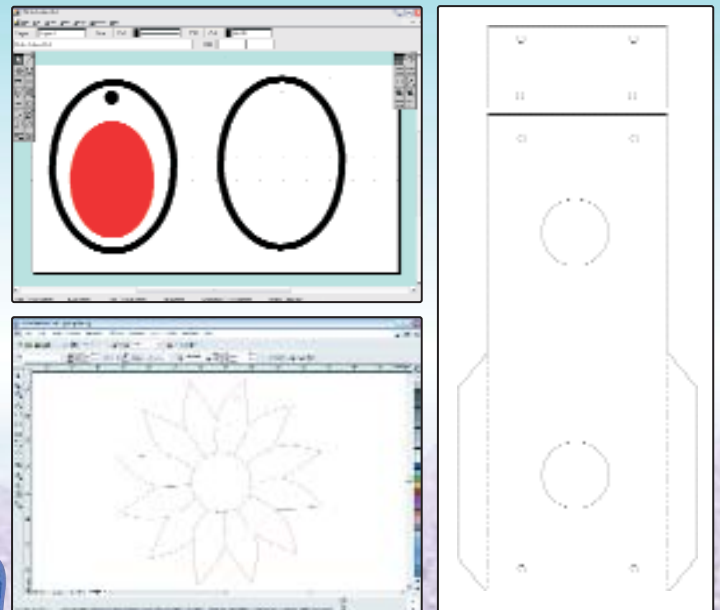
The prototype air freshener housing can be designed to be manufactured in acrylic sheet, MDF or other sacrificial material for a vacuum form mould or card to create a net for a graphic product.

Graphics

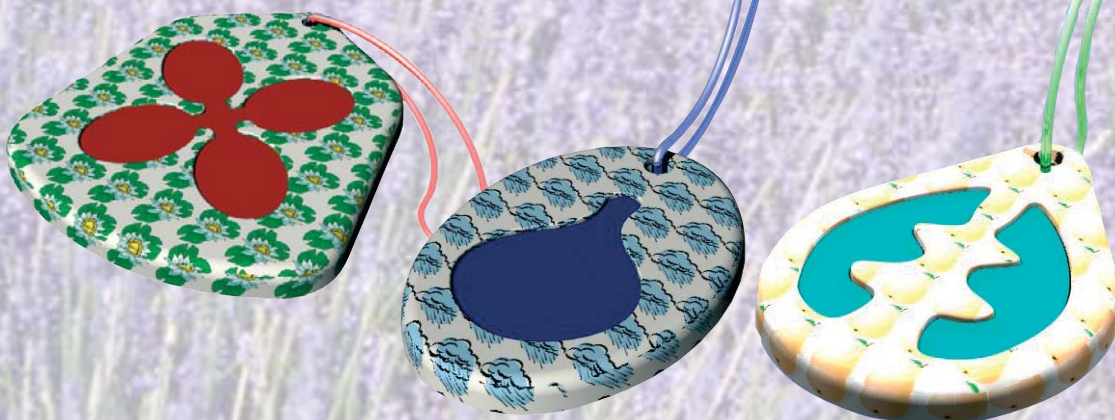
Create a patterned surface design with a bitmap image using the Tile command in Corel Draw or a repeat in software such as SpeedStep.



The development can be taken further using ProDesktop to visualise the design.



Prototype housing designs using various software packages

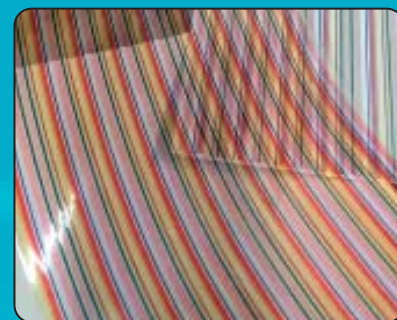


The quality and appearance of the finished product is also suitable as a surface decoration process, such as dye sublimation.

Dye sublimation is one way of transferring interesting surface designs onto products. Others include holographic films and transfers available from TEP, laser etching and laminating.

Sublimate to Originate

The dye sublimation method is an industrial process which will enable pupils to unleash their creativity and individualism on a project. Their products are instantly enhanced, giving added value, a much higher and professional quality and more aesthetic appeal. This process is used to transfer a surface design for the 'Fragrant Freebie' directly onto PVC sheet which can be vacuum formed or onto a self adhesive film which can be adhered to the acrylic prior or after manufacture.



Some more examples of 'sublimatable' materials sourced for school use are neoprene, Foamex, polyester, coated MDF, Corian, canvas, fibre glass, PCB board sublimation coated aluminum. The temperature, time and pressure setting of the heat press is dependent on the type and size of the material.

Fragrant Freebie materials heat press chart

Material	Temp	Time	Pressure
PVC sheet	180 ° C	2 minutes	Light to medium pressure
Self adhesive film	180 ° C	2 minutes	Light to medium pressure

When using the heat press it is advisable to place another unprinted sheet of heat transfer paper face down on the other side of the PVC or film to avoid contact with direct heat.



Freebie Manufacture

Manufacture can be undertaken on the appropriate CAM processes. This includes the CNC milling machine and/or a laser cutter for the acrylic version, a CNC router to manufacture a vacuum form mould and a plotter cutter, laser cutter or simply a craft knife to manufacture a card version of the Fragrant Freebie. For departments with limited CAM access, hand drawn templates can be hand or machine cut into mould materials prior to vacuum forming.

Make that Smell

Fragrance Gel Manufacture

Air Freshener gel is inexpensive, easy and fun to make and as long as a suitable container is used to house the gel, it can be applied in a variety of creative project solutions.

Materials and Equipment to make 2 -3 air fresheners

- Salix Gel Wax 325g – stock code FF1 002 (500g) approx 40mm² cube
- Salix gel colourant (optional and use only the darker colours) approx 3-5mm²
stock code FF1 004
- Essential oils (pure) approx 1/4 tspn
- Stainless steel pan or small ladle
(The ladle from the TEP pewter casting kit is ideal – stock code T00 095)
- Metal spoon
- Stove, Bunsen burner or similar
- Well ventilated room



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Make that Smell Instructions



1. Gently heat the wax gel in the pan or ladle. The gel will melt at a temperature of 70°C.



2. When molten add the small amount of wax dye and stir.
3. Remove from heat and add the essential oil. Stir (Warning: be prepared for some fumes)



4. Pour the mixture carefully into your Fragrant Freebie moulding and leave to set (Approx. 10 -20 minutes)

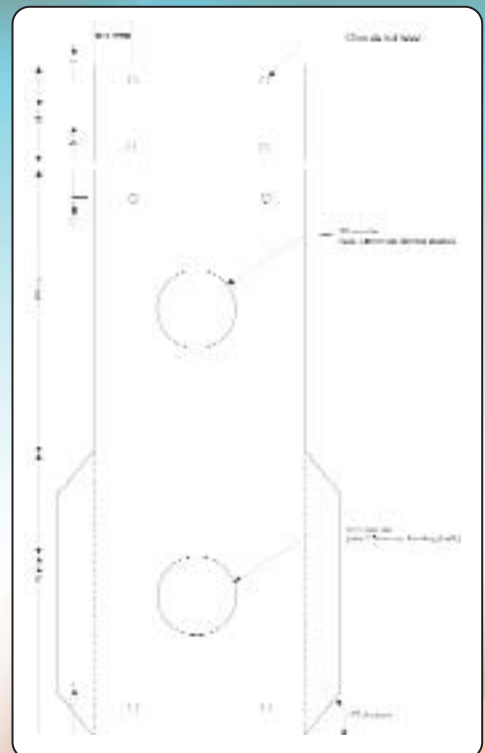


Science Note: The correct mixture requires experimentation. If too much essential oil is added the gel will not set properly. If not enough oil is added there will be too little scent to permeate the atmosphere.

Housings for the fragrant smells can also be directly manufactured in clear or light gathering acrylic sheet to create stunning products as an alternative to vacuum formed shells. Or, a simple alternative to using a CNC machined mould is a method using printed card ideas and even simpler vacuum formed moulds.

Fragrant Freebie Card Graphic Product

Draw the net accurately in a graphics package such as Corel Draw and use as a template for pupils to add their own designs. Print your design onto card and clear laminate, cut and fold along the dotted lines. Punch all the holes.



Card net template showing dimensions



Using two-pence pieces as moulds, vacuum form to create a cup for the gel with 1mm thick PVC sheet or polystyrene. Cut out the cup leaving approximately a 5mm rim all the way around the outside. Use small pieces of double sided sticky tape around the rim.

Manufacture the gel and pour into the cup. Leave to set.

Slot the cup in-between the folded card in the centre holes. The smaller centre hole is the front of the package.

Fold in the side flaps and adhere these with double sided sticky tape. Assemble the card net and join together with eyelets.



The finished Fragrance Freebie graphic product

As a low-cost fun way to extend and develop desktop manufacturing, we think Fragrant Freebies will take some beating. It can be integrated into schemes of work across Key Stage 3 in D&T and sits easily in product design, CAD/CAM and graphic products work.