

## Abstract

This paper describes the resources based on Millennium Products that are being produced by the Design Museum and the Nuffield Design and Technology Project. It explains the philosophy underpinning the work and the attempts made to ensure that the materials will be effective in the classroom.

## A special project funded by the Design Council

The Nuffield Design and Technology Project and the Design Museum are collaborating in developing a set of educational resources for secondary schools that make use of those products that have been singled out as being particularly innovative and noteworthy by the Design Council i.e. Millennium Products. Details of these products and the companies that have produced them are on the Design Council Innovation website<sup>1</sup> but in this form they are not easily used as resources for schools. However it is clear that within the products themselves and the processes that led to their conception, design and manufacture there is abundant educational material. With this in mind the Nuffield Design and Technology Project<sup>2</sup> and the Design Museum<sup>3</sup> approached the Design Council for Special Project Funding to develop a set of resources for design and technology in secondary schools based on Millennium Products. Such a resource is seen as worthwhile because it will help teachers deal with an area of acknowledged difficulty – product evaluation<sup>4</sup>.

## Which Millennium Products?

These Millennium Products will form the basis for a set of 10 written and illustrated case studies:

- Divine Chocolate  
Milk chocolate moulded bar; the first mainstream, high quality product on sale nationally which is fairly traded ensuring African farmers benefit.
- Protector 3D  
An innovative razor from Wilkinson.
- Freeplay lantern  
Fail-safe illumination device, it has wind-up and mains charging units to provide light wherever you are.
- Accuhaler  
An easy to use dry powder inhaler for treating asthma, using a new drug formulation.
- Anywayup Cup  
Toddler's training up incorporating patented unique valve which only allows

liquid through when the child sucks the spout.

- Skystreme  
An inflatable, radar-effective, visual location marker for outdoor pursuits.
- Electric violins  
String instruments made from kevlar and carbon fibre, featuring unique active pickup system, producing unrivalled sound and power.
- Neotrend  
A device to continually monitor the temperature and oxygen, carbon dioxide and pH levels in a premature baby's blood.
- Optimusic  
A unique control system 'played' by interacting with light beams, creating an exciting interactive musical environment accessible to all so useful for rehabilitation, education, leisure and entertainment.
- Lantau Link Bridge  
A six lane, covered railway and emergency bridge which joins Hong Kong island to the new airport.
- Heathrow Express  
High-speed new rail link between London Heathrow airport and central London taking 15 minutes every 15 minutes.

Each case study is in two parts: one part dealing with the product, the other part dealing with the designing of the product.

These Millennium Products and Millennium Materials will be included in a handling collection:

Shadow air muscle  
Ozone toothbrush  
Anywayup Cup\*  
Skystreme\*  
The remarkable recycled pencil  
Aluminium Bumper Nut  
Divine Chocolate\*  
Safeglass  
Thermafloater  
First Glow Bead  
Non polish footwear  
Non iron shirts  
High performance fabrics

Note that the written case studies are not seen as an alternative to handling a product. Some Millennium Products (\*) are present in both the handling collection and the case study set. There are however features that cannot be derived from handling a product – the thinking of the designers, the way the product is traded for example, although inferences may be made. By combining a case study

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**1 the raw materials**

**Cocoa**  
Divine is made from cocoa. Cocoa trees grow to 12-15 metres high. The cocoa pods are yellow when ripe and contain 30-40 seeds embedded in a milky, sticky, sweet tasting pulp.

**Cocoa production**  
Pods are cut down with a cutlass and split open. The raw beans are scraped out and fermented in heaps in the sun for 5-7 days. The fermentation is caused by yeast. The sticky pulp gets the process going because it is sweet and acidic which is ideal for the yeasts. Beans are spread over bamboo frames to dry for 5-10 days. They are then hand sorted and packed into sacks and stored in ventilated warehouses before transporting to Accra, The Government agency. Cocobod sells the beans to foreign buyers.

**Fair Trade**  
Fair Trade systems give a better deal to producers. A Fair Trade agreement usually guarantees:  
 • a minimum price,  
 • credit on fair terms,  
 • a long standing trading commitment,  
 • a 10% premium to pay for community development programmes.

Find out how chocolate is manufactured. Present your finding as a flow chart. Start by looking at: <http://www.cadbury.co.uk/>

approach with a handling collection approach a more rounded treatment to product evaluation can be obtained.

The written case studies have been produced to be used primarily with pupils at Key Stage 3 whilst the handling collection has been chosen with Key Stage 4 pupils in mind. However it is expected that both the case studies and the handling collection will be used across both key stages.

**Ensuring a robust approach**

The aim of the written case studies is two fold:

- to give pupils insight into the product from a variety of perspectives
- to give pupils an appreciation of how those responsible for the product worked.

To meet these aims through studies on such different products it was essential to develop a set of questions which authors would use in writing the studies. These are summarised in Panel 1 and Panel 2. Clearly not every case study will deal with every question and some questions are more easily dealt with through some products than through others. Over the entire set of studies pupils will be exposed to a consideration of all the questions. These questions also inform the notes accompanying the handling collection.

**Ensuring effectiveness in the classroom**

This has been achieved by a seven-fold approach

- a limited extent  
It is important that the studies are not overlong or too complex to read. To achieve this the studies are only four A5 pages in length and the authors used a planning grid to identify key ideas on each page, how this content linked to the questions underpinning the case studies, possible visuals, and devices to help children interact with the text. The word count for each page was strictly limited. An example of one author's completed grid (for the Divine Chocolate case study) is shown in Panel 3.
- visual appeal  
The overall design for the studies has been developed by an experienced graphic designer and each study will be individually laid out according to this design. Examples of trial case studies are shown in Figures 1 and 2.
- durability  
The case studies are in the form of an A5 landscape booklet, easy to photocopy,

**4 competing in the market place**

Maximising production and sales is important because it results in more profits for the shareholders and more money to re-invest in the business. This can be done through mainstream mass-production and marketing or through smaller production and selling into a 'niche' market. Divine chocolate was designed to be a mainstream product with a popular, mainstream taste. Divine costs 79p per 100g. The price is set to compete with other similar mainstream chocolate bars. Divine is available at branches of Tesco, the Co-op, Iceland and Sainsbury. It is also sold in many independent food stores.

The Body Shop International plc stocked Divine chocolate bars during Easter 1999, accompanied by a series of television adverts starring Ben Elton. This was his first ever product endorsement. Usually he does not do advertising.

**research** Carry out a 'blind fold' preference test of different chocolate bars, including Divine, amongst members of your class. Repeat the test so that the tasters know which brand they are tasting. Compare and comment on the results.

You can find out more about Millennium Products by visiting The Design Council website: <http://www.thedesigncouncil.org.uk/index.asp>

Approximate price per 100g of chocolate bars	
Carroll's dark	99p
Carroll's milk	99p
Cadbury Dairy Milk	42.5p
Cadbury Bournville	10.5p
Woolworth's dark milk	10p
Woolworth's milk	12.5p

**cs2 divine chocolate**

Divine chocolate is a new chocolate bar currently sold in selected supermarkets in the UK. Produced by The Day Chocolate Company (London) with Kuapa Kokoo (Ghana). It is promoted as "heavenly milk chocolate with a heart".

Cocoa is exported from Ghana into Germany where it is used to manufacture the chocolate. The Kuapa Kokoo cocoa farmers in Ghana are share holders in the company that makes the chocolate. They get a fair price for their crops.

**TRIAL VERSION**

**MILLENNIUM PRODUCTS CASE STUDY**

Figure 1: The trial case study for the Millennium Product Divine Chocolate.

printed on 200gsm card to ensure a long life and housed in a small polypropylene ring binder case for protection.

- an active approach to learning  
The case studies include several devices to ensure that pupils engage with the contents of the study. These are questions to discuss and answer so that pupils will think about what they are reading, research activities so that pupils will be required to find information not in the case study; these will make useful

homework. Some of the research activities will require pupils to use the internet. Where appropriate practical activities have been suggested.

- trialling  
Six of the studies have already been produced and have been used with several different classes of Key Stage 3 pupils in comprehensive schools in Northamptonshire. The different ways of teaching through the studies and the responses of the pupils are being observed

- Thinking about needs and wants  
What needs and wants are met by the product?  
What is it for?
- Thinking about the user  
Who is likely to use the product?  
What effect will it have on their lives and relationships?
- Thinking about production  
What materials are used and why?  
Is the product one-off/batch/mass produced? Why?  
What manufacturing processes are used? Why?  
What skills are needed?  
Where do the materials and other resources needed for production come from? Are they likely to run out?  
Is there a problem with side effects – waste disposal or pollution?  
What are the social and economic effects of manufacturing the product?
- Thinking about performance  
How does it work?  
How easy is it to use?  
What manufacturer's information is supplied with the product?  
Does the user require written/graphical information?  
Are there any risk assessment issues in relation to the use of the product?
- Thinking about trade  
How is the product promoted?  
Does it have an identity or image?  
How has this been achieved?  
Does the promotion target a particular age group or sector of people?  
Does the promotion target potential buyers and/or users?  
What assumptions have been made about the potential buyers/users?  
How is it sold?  
Where is it sold?  
What is the importance of the packaging in selling the product?  
What is the product's cost in relation to the income of potential buyers/users?
- Thinking about use  
How will it be used?  
What effects will using it have, including those beyond intended use and user?
- Thinking about disposal  
How is any packaging disposed of?  
What happens to the product after use?  
How long will it last?  
What factors limit/lengthen its life span?  
Can it be repaired? Can parts be replaced?  
How easily can it be recycled?  
Who would pay for the cost of recycling?

*Panel 1: Questions for reading the product.*

Panel 2: Questions for the designers.

- Background  
Who commissioned the work?  
Have you designed this sort of product before? If not, why were you asked?
- Issues and constraints  
What brief were you given?  
What were the key design issues?  
What were the main constraints on your design?  
Were you given a more detailed specification? If so, at what stage?
- Creative thinking  
Did you consider many alternatives before arriving at this solution?  
What (if any) was the driving generative idea behind the design?  
What influences informed the development of the design?  
How did you justify the aesthetic decisions within the design – colour, texture, shape, form, proportion?  
How did you justify the technical decisions within the design – the way it works, the choice of materials and components?  
Did you have to abandon an idea that you liked? Why?  
What was the most difficult problem/sticking point that you had to resolve? How did you resolve it?
- Logistics  
Whom did you consult about the design? Why?  
At what stage(s) did you consult them? Why?  
How long did the designing take?  
How many people were involved in the designing?  
Who were they/what roles did they play?
- Evaluation  
How were prototype designs evaluated with the client/customer before final production?  
To what extent are you satisfied with the finished product?  
What might you have done differently?  
Is there anything that particularly pleases you?

Panel 3: The planning grid for the Divine Chocolate Case Study.

Page and word count	Key ideas	Links to questions	Possible visuals	Devices to help children interact with the text
Side 1 100 words max.	<ul style="list-style-type: none"> <li>• The product</li> <li>• Commentary to give rapid overview of key points about the product – chocolate and to wrapper</li> </ul>	<ul style="list-style-type: none"> <li>• Thinking about trade</li> <li>• Thinking about production</li> </ul>	Chocolate bar unwrapped with bite out must show deal for Cocoa growers logo	None
Side 2 200 words max	<ul style="list-style-type: none"> <li>• The raw material</li> <li>• What happens to beans</li> <li>• Idea of free trade</li> </ul>	<ul style="list-style-type: none"> <li>• Thinking about production</li> <li>• Thinking about trade</li> </ul>	Map showing source of Cocoa Visual of cocoa bean	Research question about chocolate manufacture
Side 3 200 words max	<ul style="list-style-type: none"> <li>• Information and messages on the packaging</li> </ul>	<ul style="list-style-type: none"> <li>• Thinking about needs and wants</li> <li>• Thinking about performance</li> <li>• Thinking about use</li> <li>• Thinking about the user</li> </ul>	Packaging	Questions about eating habits
Side 4 200 words max	Competing in the market place	<ul style="list-style-type: none"> <li>• Thinking about trade</li> <li>• Thinking about performance</li> </ul>	Other chocolate products	Research through a tasting panel

Figure 2: The trial case study for Designing Divine Chocolate.

by an Open University team well versed in classroom observation. The results of these trials will inform the final editing of the studies and the contents of the teacher handbook.

- supporting teacher handbook  
The results from the trialling and the experience of the authors in writing the studies will be used in producing a teacher handbook that will provide guidance on how to make effective use of the case studies in the classroom and describe how teachers can write their own product case studies and enable their pupils to do likewise.
- dissemination through inset  
The case studies and the handling collection will be made available through in service training sessions organised by the Design Museum and the Nuffield Design and Technology Project. The providers of this training will be Education Business Partnerships and Nuffield Area Field Officers. The training will be through short twilight sessions and free of charge. It will take place from April onwards at different venues around the country<sup>5</sup>.

**References**

- 1 The Design Council Innovation Website can be found at this address  
<http://www.sharinginnovation.org.uk>
- 2 The Nuffield Design and Technology Project is based at the Nuffield Curriculum Projects Centre, 28 Bedford Square, London WC1B 3EG
- 3 The Design Museum is based at Shad Thames, London SE1 2YD
- 4 See for example *Secondary Education 1993-97: A Review of Secondary Schools in England*, OFSTED (1998) The Stationary Office, London
- 5 If you are interested in taking part in this training please contact Nina Towndrow at the Nuffield Curriculum Projects centre email [ntowndrow@nuffieldfoundation.org](mailto:ntowndrow@nuffieldfoundation.org) telephone 0171 436 4412

ds2 designing divine chocolate





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**Fair Trade** has been designed to ensure that producers, often those in the developing world, are not exploited. Behind it is the idea that it is wrong to buy or use a product which has been produced by workers who do not get a fair deal. It ensures direct links between product consumers and producers. It often involves independent democratic organisations of small producers.

The fair trade logo is a consumer guarantee that the producers and their communities are supported by purchasing the product. Divine Chocolate is just one of a growing number of fair trade products.

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**the specification**

The Day Chocolate Company developed this design specifications for Divine chocolates. It should be:

- a mainstream product with a popular, mainstream taste;
- a good quality chocolate product with quality ingredients;
- fun and enjoyable (not "worthy", despite its fair trade aims).



2

The Day Company explored a wide range of recipes before choosing the one which became Divine chocolate. The different recipes were produced by several manufacturers on different sites and the product "taste-tested" by small groups of consumers. The final product was selected for its quality taste, smoothness and compatibility with general market expectations for a "good British-tasting milk chocolate". It was recipe version 59 and had a higher cocoa solids content than regular milk chocolate



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**informing the consumer**

critical trading is a growing factor within the UK retail market. Some consumers prefer products and retailers that minimise harm to people or the environment. These products can be more expensive so choosing them is not an option for many consumers. In such cases they remain an exclusive, niche market. However, Divine is aimed at a wide audience and The Day Chocolate Company wants to take the awareness of Fair Trade issues amongst a broad, mass market of consumers.

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The Day Chocolate Company provide post cards which show all people to address to the manager of a shop of supermarket. It's does not post Divine, asking them to stock it. The Slogan: Stock the choc!

**is it a success?**

Divine has a long way to go to become a major brand name. Sales of Divine have a different impact including the growers' pride in being part of a big international company, the opportunity this gives them to welcome visitors and web visitors to Ghana, to travel and visit people in Britain and to earn extra for projects in the growers' communities. Two important projects have already started: drinking water in villages and schools' improvements and repairs.

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You can find out more about Millennium Products by visiting this Design Council website <http://www.sharinginnovation.org.uk/index.asp>

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Find out about the way other products are produced using Fair Trade. Start by looking at these websites  
<http://www.divinechocolate.com>  
<http://www.globalexchange.org>  
<http://www.fairtrade.org.uk>  
Contact Lucy Hum on [lucy@divinechocolate.com](mailto:lucy@divinechocolate.com) for information about supporting Fair Trade through Divine Chocolate.