

Attribute

Analysis


Continuing from our last issue feature on Design Decisions, Dr David Barlex reminds us of an ideal technique for analysing existing products and generating ideas for new ones.

A powerful teaching tool

One way to get a really good idea is to have lots of ideas and throw away the bad ones. Attribute analysis is a technique that enables all your pupils to have lots of design ideas and develop those that show most promise. It can also give them insight into the way a single product can give rise to a range of products. A good example is the humble Kit Kat – a snack biscuit made from wafer and chocolate.

Table 1 below is an attribute analysis of the Kit Kat

Table 1
Kit Kat attribute analysis



Kit Kat	Size	Shape	Flavour	Texture	Nutrition	Image	Cost
	Medium	Fingers	Sweet	Crisp & crunchy	High fat, sugar & carbohydrate	Everyday	Low

If we change just the size and shape attributes and make the size of the fingers larger and reduce the number of fingers to one, we develop the 'chunky' Kit Kat.

If we change the size and shape in the other direction and make fingers small and increase their number we get Kit Kat 'Kubes'.



We can be more radical and change lots of attributes so we conceive of a product that is medium sized, sweet, sickly, creamy, gooey, high in fat and sugar with a slightly sleazy image and we get a chocolate cream egg. Now of course, we can't use the ingredients of a Kit Kat to make a cream egg but we can use the attributes of the Kit Kat as a starting point for enabling your pupils to generate lots of design ideas for different products.

With able pupils you can start with the attribute analysis of a single product and ask them to develop a table with different possibilities for each of the attributes. You might get a table like Table 2 shown below. With less able pupils you might provide them with a partially developed table and ask them to think of some extra possibilities.

Table 2

An attribute analysis table for a snack biscuit (shown in red) with alternative attributes also listed (shown in blue)

Size	Shape	Flavour	Texture	Nutrition	Image	Cost
Medium Small Large	Fingers Circle Oval Rectangle Square Triangle Sphere Thin Thick Wide Narrow Animal Plant	Sweet Sour Salty Bitter Savoury Spicy Sickly Herbal Fishy Meaty Fruity	Crisp Crunchy Soft Firm Hard Dry Moist Crumbly Brittle Creamy Sticky Tough Tender Chewy Rubbery Gritty Greasy Goey Slimey	Fat Sugar Carbohydrate Protein Fibre Vitamins Minerals	Everyday Special Modern Traditional Healthy Luxury Sleazy Hi-tech Green	Low Medium High

Now it's a case of reading of one or more from each column to give you a set of attributes for a new product. Your pupils can do this many times each time generating a new product idea. In many cases the combination of attributes results in products of limited appeal but often a new and interesting product proposal emerges. For instance Large, animal, fruity, moist, crumbly, crisp, carbohydrate, protein, fibre, sugar, green and medium gives us a medium cost, endangered species-shaped fruit biscuits for a child's school lunch. For less able pupils you can choose a set of attributes from the table and ask them to comment on its feasibility. And this approach works for all focus areas in D&T.

Table 3 below shows an attribute analysis table for sensing systems.

Table 3

An attribute analysis table for sensing systems

What it senses	Where it senses	Style	User	Response & Display
Presence of smoke Change in Temperature Change in light level Change in noise level Change in moisture content Change in magnetic field Change in pH	Home Office Leisure environment Gentle industrial environment Harsh industrial environment Outdoors	Plain & unobtrusive Distinct & prominent Functional Decorative Period	Untrained adults Trained adults Impaired hearing Impaired vision Impaired manipulation	Alarm noise Alarm lights Digital readout Dial readout Monitor readout Print readout Memorised data



Reading across the columns of Table 3 and combining different attributes into an attribute profile will create new design proposals.

← The blue set of attributes leads to a device that continuously monitors the temperature of a patient in hospital.

The red set of attributes leads to a safe noise level monitor for a disco. →



As your pupils become familiar with using attribute analysis they will be able to identify attributes for the initial product or system analysis.

Trying out these exercises regularly with individual pupils and in pairs and groups will prove a really effective tool that pupils will use again and again in researching both existing products and in developing their own.

→ You can download free of charge Resource Tasks to teach Attribute analysis from the Nuffield Secondary D&T website www.secondarydandt.org