

Design Rules...

OK?



John Lee and Rowan Todd continue their design rules series with a closer look at some more useful methods.

Identifying, clarifying and defining the task

As we suggested in our introductory article in the previous News and Views, if pupils are to become effective, independent practitioners in design and technology, they will need to develop a flexible framework of skills, knowledge and understanding that they can call upon whenever needed, to support their designing.

The National Curriculum suggests that pupils look for 'needs, wants and opportunities' upon which to focus their designing, but where do these come from?

During Key Stage 3, most pupils will have been working to design briefs and specifications drawn up by their teacher. As their studies progress into Key Stage 4 they need to be given the opportunity, perhaps for the first time, to develop their own design briefs, establish relevant design criteria and convert these into design specifications. This is no easy task – it requires pupils to use high level thinking skills, which need plenty of practice and support in the early stages if they are to develop successfully!

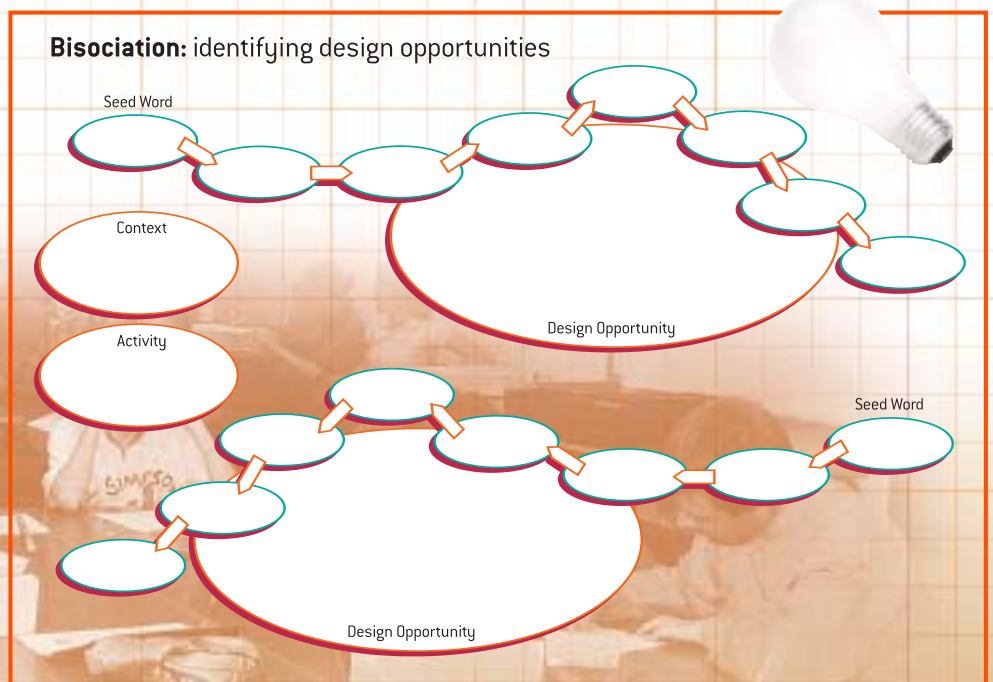
This issue we explore two techniques that have been used to good effect in schools to help pupils explore design opportunities in a creative way and so develop their *designerly* thinking.

Identifying design opportunities through 'bisociation'

Bisociation is a lateral thinking technique based on the work of the philosopher and author Arthur Koestler, who highlighted the link between creativity and random thought processes. The idea is that the mental 'collision' of seemingly unrelated words can result in creative thought. This strategy encourages pupils to think creatively about design opportunities and to frame appropriate design briefs. This works particularly well with older pupils (KS4/5) who may be involved in more open ended design and technology activity. The strategy also encourages teamwork by engaging pupils in discussion with their peers about design opportunities.

Using the strategy:

Pupils should be arranged to work in pairs. Each pair is supplied with a suitable book, pen and blank sheet of paper or, better still, a pre-prepared grid like the one shown. One pupil from each pair is assigned the task of 'scribe', the other of 'free thinker'.



continued overleaf >>

Design Rules...

continued

OK?



Next, a suitable context and activity are chosen from a number of given possibilities, for example, from the table shown, a pair might select say *storage* and *sport*. These should be written on the sheet of paper.

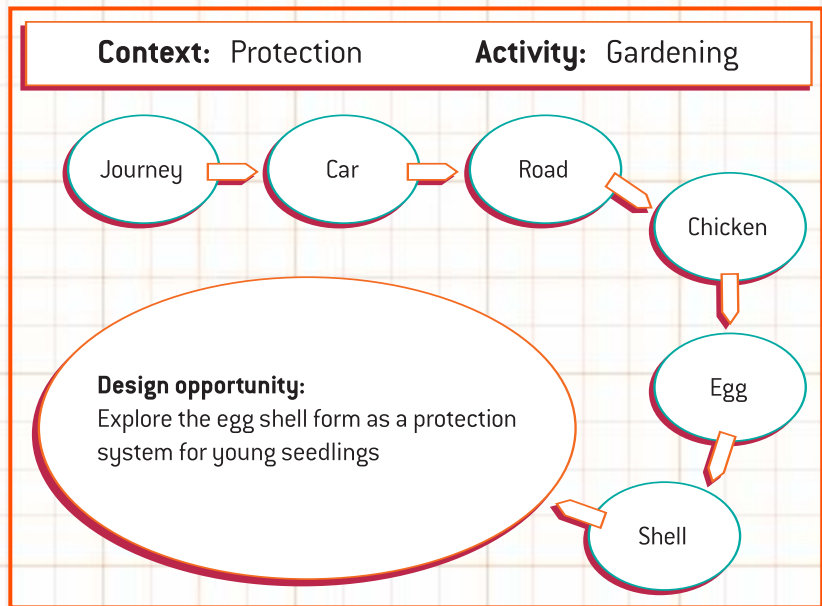
Context	Activity
Protection	Sport
Storage	Travel
Security	Gardening

Pupils should be encouraged to keep making mental links between the words generated and the context/activity to see if a suitable design opportunity emerges. The proceedings can be halted at any time by either party in the pair as soon as a productive link is found.

To conclude, any design opportunities that have emerged can be refined through further discussion. Pupils should then be encouraged to express each design opportunity in the form of a design brief.

In their pairs, the pupils then need to obtain a random or 'seed' word. They do this by choosing the first noun in a given line on a given page of the book. This could also be done in other ways - for example by using a random word generator or it could be the first object seen when looking out of a window.

The 'free thinker' now calls out the first word that comes to mind when thinking about the seed word/object. This is recorded by the scribe. Pairs continue with this process, quickly building up lists of words by free association.



Developing 'designerly' thinking through product analysis

Product analysis tasks have long been a key feature of effective design and technology education. Interactive learning through the analysis of real products can capture the pupils' interest and perform a vital role in helping them to develop and refine their skills of judgment, decision making and evaluation.

Such work can form an introduction to many design and technology activities. It can help pupils to understand the needs of potential users, gain insights into the thoughts of the designer and develop their knowledge and understanding of design principles, materials and manufacturing processes.



Developing Design Criteria			Product																																					
Before exploring ideas for new products, designers often begin by looking at the way in which similar products have been designed. These are some of the questions that they might ask themselves:																																								
What were the criteria that the designer needed to consider? Were they essential or just desirable?			How important were the criteria? How successfully have they been met?																																					
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: left;">Performance</td><td style="text-align: center;">E</td><td style="text-align: center;">D</td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table>	Performance	E	D										<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: left;">Safety</td><td style="text-align: center;">E</td><td style="text-align: center;">D</td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table>	Safety	E	D										<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: left;">Ergonomics</td><td style="text-align: center;">E</td><td style="text-align: center;">D</td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table>	Ergonomics	E	D										E = Essential D = Desirable	
Performance	E	D																																						
Safety	E	D																																						
Ergonomics	E	D																																						
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: left;">Environment</td><td style="text-align: center;">E</td><td style="text-align: center;">D</td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table>	Environment	E	D										<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: left;">Maintenance</td><td style="text-align: center;">E</td><td style="text-align: center;">D</td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table>	Maintenance	E	D										<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: left;">Economics</td><td style="text-align: center;">E</td><td style="text-align: center;">D</td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table>	Economics	E	D											
Environment	E	D																																						
Maintenance	E	D																																						
Economics	E	D																																						
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: left;">User</td><td style="text-align: center;">E</td><td style="text-align: center;">D</td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table>	User	E	D										<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: left;">Manufacture</td><td style="text-align: center;">E</td><td style="text-align: center;">D</td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table>	Manufacture	E	D										<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: left;">Appearance</td><td style="text-align: center;">E</td><td style="text-align: center;">D</td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table>	Appearance	E	D											
User	E	D																																						
Manufacture	E	D																																						
Appearance	E	D																																						
Which criteria are not being fully met?			Can you suggest an improvement?																																					

Product analysis – ‘under wraps’

The aim of the activity is to help pupils to develop their ‘designerly’ thinking through product analysis activities that establish and prioritise the design criteria for successful products. The name is taken from the automotive industry where an element of surprise and anticipation is created by keeping the new product ‘under wraps’.

Using the strategy:

A range of products is hidden from view beneath a blanket. The activity can work equally well using a diverse range of products e.g. cycle helmet, training shoe, kitchen accessory a house-brick or several versions of the same product.

It is important however, that the chosen products are items that capture the interest of the pupils.

This lends itself to a team activity, with typically 3-4 pupils in each group. The activity begins with one pupil from each team selecting an item, unseen, from the range available.

The teams are given time to establish a range of ‘design criteria’ necessary for the success of the product in meeting its prescribed need (younger pupils could be given prompts to aid discussion at this stage, for example: *what must the product do? / what must the product not do?*)

The pupils then need to group these criteria under the headings given on the ‘Developing Design Criteria’ sheet shown above. They should identify those which they think are ‘essential’ (E) and those which consider to be merely ‘desirable’ (D).

The teams should then consider:

- whether there are design criteria that are not being fully met
- what improvements could be made to the product
- why these improvements may not have been done
- what a design brief for an improved version of the product could look like

Each team should then prepare and deliver a brief presentation providing an analysis of their chosen product.

Subsequent teacher led discussion can focus on a number of issues including for example:

- the conflicting demands placed on the designer / manufacturer
- trade-offs between design criteria (e.g. form and function)
- differing needs of potential user groups
- choice of materials and processes

Over to you....

In this article we have looked at a couple of techniques designed to help pupils to identify, clarify and define more open ended tasks in design and technology. We hope you have fun trying them out and find them useful - If you require any further clarification or would like to share your experiences in using the techniques, please feel free to contact us.

Next time in News and Views we will be looking at how we can support pupils when they move on to generating, developing and selecting ideas.

j.c.lee@shu.ac.uk
r.m.todd@shu.ac.uk