Design Briefs for Resistant Materials

The following list of possible projects is provided as a starting point for candidates. Candidates may use them, adapt them or devise their own.

1. A jewelry shop owner would like you to design and make an exciting disp lay to sell sports watches. He would like you to produce a presentation board of your ideas before making the prototype, which is to be manufactured for all shops in the same chain. (You might use CAM to repeat a set of interlocking parts.)
2. Puppets have been used as a form of entertainment throughout history. Children gain a great deal of pleasure from making the puppet work, enabling the device to take on different personalities. A local museum has shown an interest in the historic value of a live puppet theatre. Design and make a small range of puppets and a small puppet theatre that will enable ease of transportation.
3. Many young people with learning difficulties can benefit from activity products. Using a range of materials and techniques, design a product that will be of some educational value to a child with learning difficulties. Design and make the jigs that would be needed to manufacture ten of the products.
4. Timepieces have been used in many cultures and throughout history both for functional and decorative reasons. They often reflect something of the culture from which they originate. Design and make a timepiece that reflects your culture or the culture of another country.
5. You have been commissioned by an Art Gallery to design a simple, single flat-pack seat for visitors, which reflects an art theme and can be batch produced. If your designs are successful the gallery will consider having them produced in quantity to be sold at its shop. You are required to make a sample seat and produce designs for its packaging. Suggest how CAD and CAM could be used to cut the parts using a flat bed router.
6. Your school has been asked to submit work to be displayed at a Technology Exhibition. Design and make a range of futuristic 3D, slot together decorative items that illustrates the use of modern materials and techniques with particular emphasis on the use of CAD/CAM.
7. Toys or learning activity centres are always popular with young children. Those that are most effective usually have some type of action or moving parts built in. A manufacturer of this type of product has asked you to design and make a small range of toys, one of which has an action feature and a storage system in which to store these toys.
8. A firm selling candles is looking for a new matching range of candleholders in a variety of resistant materials. A typical matching range would include holders for positioning on a table, wall and floor. Design and make sample sets for different occasions that could be batch produced.
9. A manufacturer of storage systems wishes to commission a new series of products that will be aimed at the higher quality end of the market. You are asked to design the range and make up several products, paying attention to style, colour, quality and ergonomic efficiency. Consideration should also be given to the promotion of the product, using special display packaging.
10. A gift shop sells quality gifts that vary in price and complexity to suit customers. Some of the gifts are animated or have moving parts to add interest. Design and make a range of matching or related products aimed at teenagers or adults that could be batch produced for sale in the gift shop.

Design Briefs for Systems and Control

The following list of possible projects is provided as a starting point fo r candidates. Candidates may use them, adapt them or devise their own.

1. A local pet shop wishes to sell a range of devices that will automatically feed small-cage pets (such as rabbits, gerbils, mice etc) when their owners are away for the weekend. Design and build a prototype device that could satisfy this need. The product will be batch produced.
2. A farmer has noticed that his free-range chickens will all go back to the hen house on their own at dusk. He still has to shut the door each night to secure them from foxes. Design and make an automatic door that closes at dusk and opens in daylight.
3. The dining room at a local school becomes over-crowded because there is no system to control when pupils enter or leave. Design a control system that can monitor numbers of pupils as they enter and leave the dining room and will indicate which year group should enter next. You should consider health and safety issues and a manual over-ride, so lunchtime supervisors can take control if necessary.
4. Manufacturing companies must carry out extensive tests on products, to ensure they work reliably before they are sold. Identify a suitable product and design and make a test rig that could be used to ensure it will work correctly over an extended period of time.
5. Identify a situation where a stable environment is important. Design and make a model control system to show how this environment can be stabilised. Ventilation, temperature, brightness and air humidity are all important in this type of system.
6. When using any form of training equipment in a gym it is important to monitor your performance, record the number of 'reps' or inform the user when they have completed the required number of 'reps'. Identify one exercise or piece of equipment. Design and make a device that will help the athletes in their training.
7. Games are always popular with young children. Those that are the most effective usually have some type of timer or action built in. A manufacturer of this type of product has asked you to design and make a small electronic game, which has a timer or action feature.
8. A small electronics firm wishes to develop a range of alarm systems for particular groups of people. Design and make a prototype suitable for development by the company.
9. Pupils in Nursery or Primary Schools use play as a means of learning. Such activity often involves using educational toys. Design and make a suitable learning toy for a child that uses some form of action or moving parts.
10. The manager of a local 'super store' has asked you to design a promotional display for the entrance to the store that can be used to promote a product of your choice. The display needs to be interactive, so it will operate when someone enters the store or stands in front of the display. You have been asked to design and make a working model of this, to show how it will work.
11. A primary school is collecting aluminium drink cans for charity. To reduce storage space it is necessary to check if the can is made of steel and then to crush it flat. Design and make a device that will allow the pupils to carry out this task and provide some form of reward.