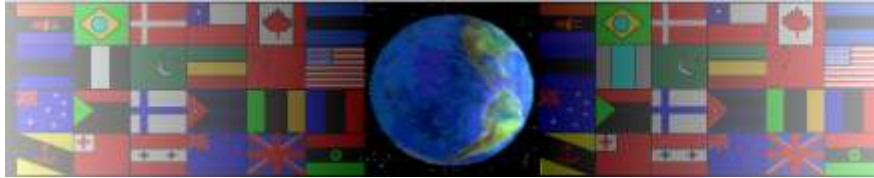


DESIGN PROBLEM AND BRIEF EXERCISES EXERCISE

V.Ryan © 2000 - 2009

On behalf of The World Association of Technology Teachers

W.A.T.T.



World Association of Technology Teachers

This exercise can be printed and used by teachers and students. It is recommended that you view the website (www.technologystudent.com) before attempting the design sheet .

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SAMPLE DESIGN PROBLEMS

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Below are two sample design problems for a game. They have been divided into sentences and you are to write an alternative sentence in the spaces provided. The aim of this exercise is for you to construct a design problem for your own board game project.

PROBLEM ONE

A local company designing and manufacturing educational games have recently found that sales of its games have fallen.

Without an increase in sales it is likely that the company will stop trading.

In the past the company has relied on its existing traditional (old fashioned) games. However, a recent survey has shown that modern, educational games are popular.

The survey also shows that the most popular games include well known characters or are linked to well known TV programmes.

It is also well known that parents tend to buy games that are educational rather than the traditional games that the company currently produces.

PROBLEM TWO

A local Primary School has approached me to design an educational toy to help develop hand - eye coordination.

A survey of a thousand parents and teachers has shown that an interesting educational game is likely to be very successful and of more value to children.

The Primary School has specified that characters can be included as an important aspect of the game as this will encourage young children to use it.

It is well known that children are more likely to play an educational game if it is both colourful and incorporates movement/mechanisms.

The game must have a name that interests young children and is 'catchy' and easy to remember.

SAMPLE DESIGN PROBLEM

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Below is a sample design problem for an educational game/device. It has been divided into sentences and you are to write an alternative sentence in the spaces provided. The aim of this exercise is for you to construct a design problem for your own educational project.

DESIGN BRIEF

I am going to design and make an educational game for young children that will encourage the development of hand - eye coordination skills.

The game will include movement, sound and lights through the use of a programmable circuit and mechanism.

The game will encourage children to learn about letters and numbers through interesting themes.

It will be robust and strong so that it can stand up to everyday use.

Natural materials such as pine will be used as well as modern materials such as plastics. Recycled materials will be used where possible.

The device will be safe and easy to use and interest parents as well as children.

It will be relatively cheap to make and it will be possible to manufacture on a production line.

SAMPLE DESIGN PROBLEMS

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Below are two sample design problems for a shop display. They have been divided into sentences and you are to write an alternative sentence in the spaces provided. The aim of this exercise is for you to construct a design problem for your own board game project.

PROBLEM THREE

A local supermarket designing have recently found that sales of its CDs and DVDs have fallen.

Without an increase in sales it is likely the supermarket will make workers in this section redundant.

In the past CD and DVD sales have been quite good because shoppers have browsed through this section whilst doing their normal weekly shopping.

However, with the growth of internet shopping, especially in music and entertainment the Entertainment section of the supermarket has suffered a reduction in sales

A local survey has found that many local people are visiting alternative shops that exclusively sell CDs and DVDs.

Younger people and teenagers like the atmosphere in stores such as HMV and Virgin records. These stores allow for shoppers to sample the music in a young and vibrant atmosphere.

New technology such as 'i-pods' and 'mp3' players have meant that the traditional CD-rom is no longer the main way of storing music.

A local graphic / interior designer was employed by the supermarket to suggest ways in which sales can be increase.

He / she found that customers were not impressed with the promotional displays that are on show when a new CD or DVD comes on the market.

Also, customers considered the Music section as lacking impact and colour. It was too like a supermarket.

SAMPLE DESIGN PROBLEM

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Below is a sample design problem for a shop / supermarket display. It has been divided into sentences and you are to write an alternative sentence in the spaces provided. The aim of this exercise is for you to construct a design problem for your own display project.

DESIGN BRIEF

I am going to design and make a display for the entertainment section of a supermarket.

It will be interesting to all ages and attract potential customers.

The display will be mobile so that it can be positioned in different parts of the store, or where most shoppers are gathering (for example, the tills).

It will be stable and able to withstand trolleys and people 'knocking' into it. It will not topple over.

The display will include movement, sound and lights.

It will be amusing and entertaining as well as promoting the CDs and DVDs that are on sale in the shop.

It will be safe both for the staff who will supervise and set it up as well as the customers.

Any mechanical device will be safely housed so that hands and fingers cannot be trapped or injured.

It will be powered by either a transformer or batteries and so will be electrically safe.

The display will automatically start when a customer passes by and stop when there are no customers in the area. This will save energy.

It will be possible to update the display without the need to completely dismantle it. Special tools will not be required.

The display will be easy to use.

PROBLEM FOUR

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A local pet shop owner has been asked many times to supply an automatic animal feeder by customers.

Some customers have holiday homes and go away at the weekend or for short breaks.

However, they do not always want to take along their small pets (Hamsters etc.....) as they find this inconvenient.

Small animals like hamsters need very little care and can be successfully left for short periods of time, as long as they are fed and watered.

The local pet shop owner has carried out a survey and found that there may be a market for a range of automatic pet feeders.

DESIGN BRIEF

I am going to design and make an automatic pet feeder for a small animal.

The feeder will be a prototype and it will be fully tested before being manufactured for potential customers.

It will feed and water an animal on a regular basis ensuring its health and safety.

It will work through a number of circuits and mechanisms. The circuits will be low voltage, for safety reasons.

A PIC micro-controller may be used as it can be reprogrammed allowing the timer to have different settings.

The feeder will be cheap to manufacture and be reliable and it will be supplied with a years guarantee.

Recycled materials will be used where appropriate, for environmental reasons and to reduce the overall cost to the customer.

PROBLEM FIVE

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My uncle enjoys gardening and also has a green house.

Although the green house is quite large, due to severe winter weather the plants he keeps in it often fail.

My uncle is also forgetful and often fails to water the plants regularly.

He finds it difficult to keep to a routine and as a result the plants suffer and rarely flower to their best.

As he gets older he complains about the amount of time he spends manually watering the plants and opening and closing its windows to allow ventilation.

DESIGN BRIEF

I am going to design and make a green house with an automatic environmental control system.

It will keep the temperature to a constant level, opening and closing windows to allow ventilation.

On cold days and nights it will control heaters, keeping frost away from the plants.

The system will automatically operate blinds that protect young plants from strong sunlight.

The automatic green house will allow plants to grow to their best without the constant attention of gardeners.

The system will be relatively cheap to install and be completely safe.

PROBLEM SIX

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The dining room in school is often so crowded that it is difficult to get served.

At peak times there are so many people in the dining room that there can be a shortage of places to sit and eat a meal.

On the other hand, queues outside the room are often very long and people can be kept waiting for some time before they get a chance to be served.

The queues are often very slow moving and people start pushing in, in order to get served first.

Often there are so many people waiting in the queue that it becomes a health and safety issue.

DESIGN BRIEF

I am going to design and make a system that monitors the number of people entering the school dining room.

It will indicate the Year allowed into the dining room and calculate the number of pupils entering.

When a preset number have entered it will indicate that there are no more spaces.

When numbers drop below a set level, the system will allow more pupils in to fill the available spaces.

It will be completely safe and in the case of an emergency allow manual override.

The system will involve the use of a PIC micro-controller and sensors. It may also have a mechanical operating system such as entrance and exit barriers.

DESIGN BRIEF

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I am going to design and make a modern coffee table that will look stylish and interesting. It will have a range of functions not only that of holding tea and coffee cups.

It will also have a storage area for items such as CDs, DVDs and play station equipment. The storage area will be adaptable so that it will suit the tastes of a range of people.

The product range will be manufactured from a variety of materials including natural woods and manmade boards. This will mean that it can be sold at a range of prices to suit the economic means of all potential customers.

The product will be supplied as a flat pack or as a built piece of furniture.

The table will include a low voltage lighting system so that it can be the centre/focus of the room at night. It will create a relaxed and calm atmosphere.

The table will be relatively cheap to purchase and be completely safe.