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To: College Principals
Heads of School

Subject: SEC 2018 Design and Technology Extended Project

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Heads of school are kindly requested to bring this document to the attention of all Design and Technology teachers.

Reference is made to the SEC 2018 Design and Technology syllabus. Candidates are to prepare an extended project in line with one of the situations by the MATSEC Examinations Board.

Thank you for your co-operation.



SEC 33 Design and Technology 2018
Extended Project Situations

ELECTRONICS

Note: Please note that both discrete electronics and microcontroller electronic solutions may be used as long as these solutions are not derived directly from ready-made or modular circuits. If PCB circuits are developed as a main solution, these must be exclusive for every student. The use of mains voltage power supplies is not recommended.

Situation 1

Many board games require devices to help players take turns, or call out numbers randomly. Dice are not always suitable for this purpose due to terrain limitation and number of players, which often vary between games.

You are requested to design and build an electronic system that will randomly choose a player from a minimum of two, to a maximum of five players when the system is triggered. The system should create a degree of suspense before the chosen player is revealed.

The system prototype should be a physical product that can be sold as is or within a physical game package. (However no retail packaging is required).

Situation 2

Keys are used for different applications. Very often people are given a key to have access to areas or items. Unfortunately when such keys are lost, it is very costly and time consuming to replace keys or locks.

You are requested to design and build a low-cost electronic system, which uses an identification device to trigger a lock. The system should sound an alarm for a set time when someone is trying to tamper with the system.

The system should also allow a technician to change the code without the need to replace the system.

Situation 3

It is very important to bath new-borns and toddlers in water that is at the right temperature. A sudden drop or rise in water temperature can be very dangerous.

You are requested to design and build a system with a minimum of **THREE** outputs. One indicating that the temperature is optimal, another if the temperature is too cold, and a third output that will sound a pulsating alarm should the water temperature rise above optimal temperature.

The system should be presented as a working prototype that also considers how such a device may be physically designed and used. The device casing required, needs only be representational.



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FOOD

Situation 1

One of the latest popular snacks with adults is cereal bars because they are ideal as snacks during a busy day. However, ready to buy cereal bars are usually packed with high content of sugars. The local confectionary has asked you to present and prepare **TWO** examples of healthy cereal bars ideal for people who suffer with Type 2 Diabetes to sell them packed at their shop. Each cereal bar should weigh between 100g to 150g. Basic branding and packaging examples must also be suggested, promoting the main product features.

Situation 2

A family business organises birthday parties. A new menu for parties aimed at 6-year-old kids is required.

You are asked to design and prepare a party set-menu which includes **FIVE** original healthy party food items, **TWO** of which are sweet items. The food items should appeal to six year olds. You should prepare at least **TWO** of each item from the set-menu.

A presentation design for the menu, including photos, must be provided.

Situation 3

A child care centre will be offering lunch to the kids attending the school.

You are asked to design and prepare **THREE** different meals which are original, healthy and appealing for the kids. Each meal should include **TWO** different superfoods as part of the ingredients list.

A presentation design for each meal, including photos, must be provided.



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RESISTANT MATERIALS

Situation 1

Very young children are often afraid of monsters. A toy company is considering to produce a new mechanical toy which helps children to overcome their fear. As the designer of this toy company, you were given the task to produce the first prototype of such a toy. In order to boost the sales of this new product, the company set out the following parameters:

- The toy should be as interactive as possible, and therefore should have a minimum of **TWO** mechanical inputs and **TWO** mechanical outputs.
- The toy should include an educational feature.

The product should avoid direct references to existing licensed characters.

Situation 2

“Twinkle Cakes” is a small bakery specialising in the production of custom-made cupcakes for special events and parties. Some of these cupcakes have delicate decorations and soft buttercream topping. The bakery would like to invest in a number of structures which display their products on food tables during events or parties. These structures need to be as compact as possible for transportation purposes, but can extended during use so that clients can have access to all cupcakes on show. The display can also having some moving parts. The bakery needs that each structure holds a minimum of 12 cupcakes and bear a “twinkle” in their design.

You are only to produce **ONE** display structure as a prototype.

Situation 3

A Maltese aquarium centre published a call for interested designers to produce a small kinetic sculpture (with mechanical movement) to be placed near the reception desk in the entrance hall of their premises. In order to have an interesting movement, the sculpture should make use of flowing water. It should also be in line with the theme of the centre. Designers were given the following options on the positioning of the sculpture:

- Fixed or placed onto the desk;
- Fitted inside the desk;
- Hanging from the desk;
- Hanging on top of the desk.



You are to submit a design proposal for this call and produce your sculpture as a prototype. The use of electric water pumps is not allowed for the prototype.



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TEXTILES

Situation 1

'Eskimo' publications is a well-known publishing house. This year it is celebrating its 50th anniversary.

The publishing house asked you, as a designer, to design a set of **SIX** commemorative bookmarks that could be produced in textiles. The bookmarks are going to be distributed with a bi-monthly magazine (six magazines in one year) and are going to form a collection.

'Eskimo' publications are asking you also to design and make a textile jacket where the six magazines and the six corresponding bookmarks could be kept. The theme of the magazines is going to be "The Animal World". All designed textile bookmarks should be original both in shape and form, while the jacket needs to be somewhat matching to the complete collection.

Situation 2

People suffering from arthritis have a problem with their grip and consequently they find it difficult to hold glasses and mugs to drink. 'Living Independently' is a company specializing in special accessibility equipment. From a survey that the company has conducted, portability of certain equipment is a problem.

The company decided to ask you, as a designer, to design a textile accessory to help these people to hold glasses and mugs in their hand. This needs to adjust to different user hand sizes and be easy to wash.

Situation 3

Your local council has decided to start an educational campaign about the three R's (Reduce, Reuse and Recycle) from early years.

The local council asked you, as a young designer, to design and produce an educational textile book (soft-book) to learn about the three R's. This book should include a game suitable for toddlers.

N.B. Company names referred to in these situations are fictitious.