Overview of Event

This event will aim to introduce girls between the ages of 14 and 18 to the world of biomedical engineering through presentations, discussion, videos, a Q&A session and active activity.

Date Proposition

The next round of school holidays is scheduled between the 25th of June to the 18th of July. A date within this period could subsequently be chosen so as to allow the girls to attend and allow for enough marketing to attract the girls to join. The proposed event is scheduled to be around 5 hours in totality yet can be made longer (inclusion of a flash mentoring session/demonstration) or shorter depending on the recommendations from WomEng.

Proposed Activity Breakdown

- Introduction and Welcome (15 minutes): Discussion around the goals of the event and what we hope the girls will achieve through being part of the event. Additionally, highlight the attitude of enquiry and openness to be able to gain from this event.
- Presentation (30-45 minutes): What is an engineering? What is biomedical engineering? How can we use it to solve problems in our community?
- Q & A (15 minutes)
- Break (15 minutes): Get up and stretch/ walk outside/ toilet Break
- Activity Introduction (15 - 30 minutes): Heart rate monitoring
- Activity Part 1 (45-60 minutes): Girls will be divided into groups of 3 or 4 and will each receive a heart rate sensor, a Mirctocontroller and a laptop. The activity will then proceed following that which is proposed here. The first part of the activity will be gaining familiarity with the tools.
- Break (15 -20 minutes): Lunch/ Snacks
- Activity Part 2 (45-60 minutes): The second part of the activity will be understanding the waveform being generated.
- Discussion (15 minutes): What did students learn from this activity? What were the difficulties of this activity? What are some ways in which the activity could be improved? Where could this system be used? What other problems could you solve with this technology?
- Conclusion and Event Evaluation (10 -15 minutes)

Resources and Cost

Venue:

Must have a projector with the ability to play audio and visual content. A whiteboard would be useful but is not essential.

Location Suggestion: WomEng Offices where the Technovation Camp was held.

Transport:

Either the girls will need to arrange their own transport (no cost) or something similar to the Technovation camp with WomEng arranging transport can be considered.

Lunch:
This will need to be determined at the point of getting participants in order to cater for dietary requirements. Perhaps WomEng would be able to assist in an estimate of cost for lunch.

Photographer:
Unsure if WomEng has any deals with photographers / could provide an estimate for costing.

Activity Resources:
General Resources:

- Access to a computer/laptop running Windows, OS X, or Linux to access Arduino IDE online
- spreadsheet program
- Note pack printing @R5/ page (PostNet colour printing cost) → 5-10 pages envisioned
- Pens @R43-45 for pack of 5 pens from Pick n Pay
- Additional Paper for questions @R14 per exam pad from Pick n Pay

Option A:

- Adafruit Circuit Playground Express (CPX) board → will need to be imported through RS @R515.90 per board

Option B (estimate):

Note: The proposed activity would need to be adapted to fit this option if the above are unable to be ordered. Cost estimates are obtained from Mantech for the most costly items only with a full estimate able to be obtained in the event that Option B is chosen over Option A.

- Arduino Uno @R345 per board
- LED's of various colours
- 200-400Ω resistors
- 10KΩ resistor
- Breadboard @R69 per board
- Heartrate Sensor @R94 per sensor
- Jumper Connections @R28 per pack

Activity Cost per Group

Costs	Option A	Option B
Activity Cost per group	R515.90	R536
General Cost per Girl (pen, notepack, question paper) in a group of 3	R73 *3 =R219	R73 *3= R219
General Cost per Girl (pen,	R73 *4 = R292	R73*4 = R292

notepack, question paper) in a group of 4		
TOTAL ACTIVITY COST GROUP OF 3	R734.90	R755
TOTAL ACTIVITY COST GROUP OF 4	R807.90	R828

Unknown Costs:

- Lunch per girl
- Photographer
- Potential Transport

Requested Equipment:

- Use of WomEng Venue
- Use of between 8-10 laptops depending on the number of girls and groups.

Number of Girls

This will depend on how big the size of the groups are (3 or 4 girls per group) and the amount able to be spent on the activity as a whole. In the event of 3 girls per group - I would recommend having 6-10 groups.

Cost of 10 Groups (excluding lunch)
Options A: R7349
Option B: R7550
Total Girls: 30

In the event of 4 girls per group - I would recommend having 6-8 groups.

Cost of 8 Groups (excluding lunch)
Options A: R 6463.20
Option B: R6624
Total Girls: 32

Human Resources

- A member of WomEng who has previously run an event to help ensure the event runs smoothly on the day
- A central organiser → this would be me to present the discussion and introduce the events
- 2-3 volunteers who understand Arduino code and have worked with a microcontroller before to assist in the activity.
- Photographer