

Project Summary - 'Innovation for All'.



We were delighted to hear about the 2016/2107 PA consulting raspberry Pi competition and were excited to create an invention which would have a positive impact on people's lives.

Over the past few months we have been working on our innovation to help improve the lives of hearing impaired people.



Our project began with the team researching products which are currently available for the hearing impaired.



We decided that we wanted to create a device that would help people who have a hearing impairment respond to the sound of a door bell and answer the door – just like you and me!

Our mission began with a design brief!

To create a door bell, which when pressed would cause a light to flash, informing the hearing impaired resident that someone was at the door.

Problem: Further research informed us that many homes – have flashing lights in each room to tell them when someone is at the door.

'You won't miss friends and relatives at your door if you have an amplified, flashing and vibrating doorbell. Some plug into sockets while others are battery powered and can be moved anywhere, including the

garden'. <u>https://www.actiononhearingloss.org.uk/shop/alerting/fl</u> ashing-or-vibrating-doorbells.aspx Even though we feel that this was a good invention to help people, we feel that buying battery powered sockets could be very expensive and if you are not near the socket how would you even see it flashing!!!

We believed that we could design and make a less costly product using the Raspberry Pi.

After lots more research, we decided to go along the wearable technology route and were excited to find a product called

'The Dot'.



We found out that The Dot, a device that straps around the wrist like a watch, uses magnets and a grid of pins to create four braille characters at a time that change at adjustable speeds, allowing users to read text messages and use apps on any device via Bluetooth.

We believed that we had found a product that was already improving the lives of visually impaired people and decided that we could use this idea to create similar product for those with hearing impairments.

Our excitement grew as we could now visualise our product and we were keen to get started!



First, we used Python to create code for the PIR sensor so that the doorbell would sense montion as someone approached it.

Once we were sure that the sensor was working, we created code for the Raspberry Pi to send data to a microbit attached by USB. This then displayed 'caller' on this attached microbit. This attached microbit then sends a message by radio to a microbit powered by battery, which can be worn around the house.





We were so excitied when it got it working.

We now wanted to add the wearable technology element into our work.

We imagined that a hearing impaired user would have a wearable device.

We felt that a microbit could be used to form the

wearable tech.

We wanted the motion from the Raspberry Pi sensor to send a message to the microbit, which would be on the arm of the user. The microbit would then show message, alerting the hearing impaired user that someone was at their door.

Once we had completed the programming aspect, we moved onto the visual appeal of a doorbell (casing for the Pi breadboard).

We created a prototype using cardboard so that our measurements would be right.





We used a programme called 'Tinkercad', to bring our prototype to life.

Tinkercad is a simple, online 3D design and 3D printing app.



Once we were happy with our design, we were ready to print.

Our box wasn't perfect first time, but after a few alterations we finally has a casing which was suitable for storing our Raspberry Pi. We decided to call our invention – Dooreen!

