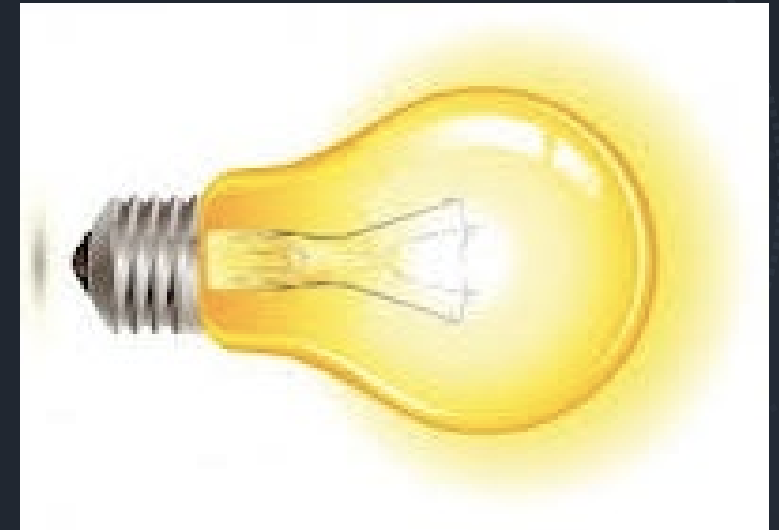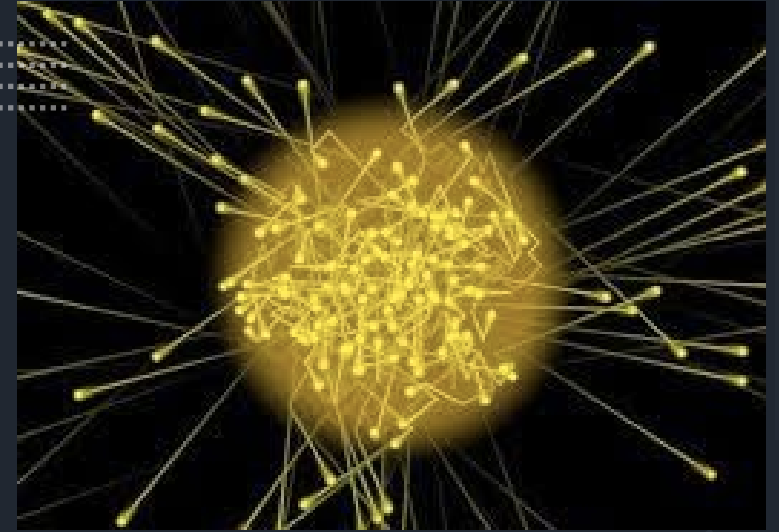# Saving Light Energy in Schools

Mini Engineers of McCloud Elementary School

Introduction

We are the Mini Engineers, and we are from McCloud Elementary School. My name is Angel Morillo, my name is Ayah Mirza, my name is Oliver Partsch, and my name is Steven Bonilla. We created a prototype to save light energy.

LOCAL ENERGY/ ENVIRONMENT ISSUES

We had many choices for Environmental issues including sound pollution, speeding, recycling issues, and many more. But we came to conclusion that our school wasted much light energy, through the lights being left on after hours.

SELECTED ENERGY PROBLEM

Our energy problem was that we had light energy being wasted in our school. When we keep the lights on, we waste energy from our school. Wasting light energy also makes carbon emission. Carbon emission
happens when coal or fuels is being wasted to make useless energy. Carbon emission is when carbon dioxide is released into the atmosphere. Carbon emission happens when people burn fossil fuels.

GOALS

The goal of our project was to program the Microbit to become a light sensor. We want the Microbit to warn the custodians to turn the lights off when they leave so they don't waste light energy.

CREATION OF PROTOTYPE

First, we made a 3-D print on Thingyverse that was able to hold the Microbit and the battery pack. Also, we programmed the Microbit as a light sensor. When the lights were on it was a sad face, when it was dim it was a straight face, when the lights were off the face was happy. We also have an image of the 3d print.
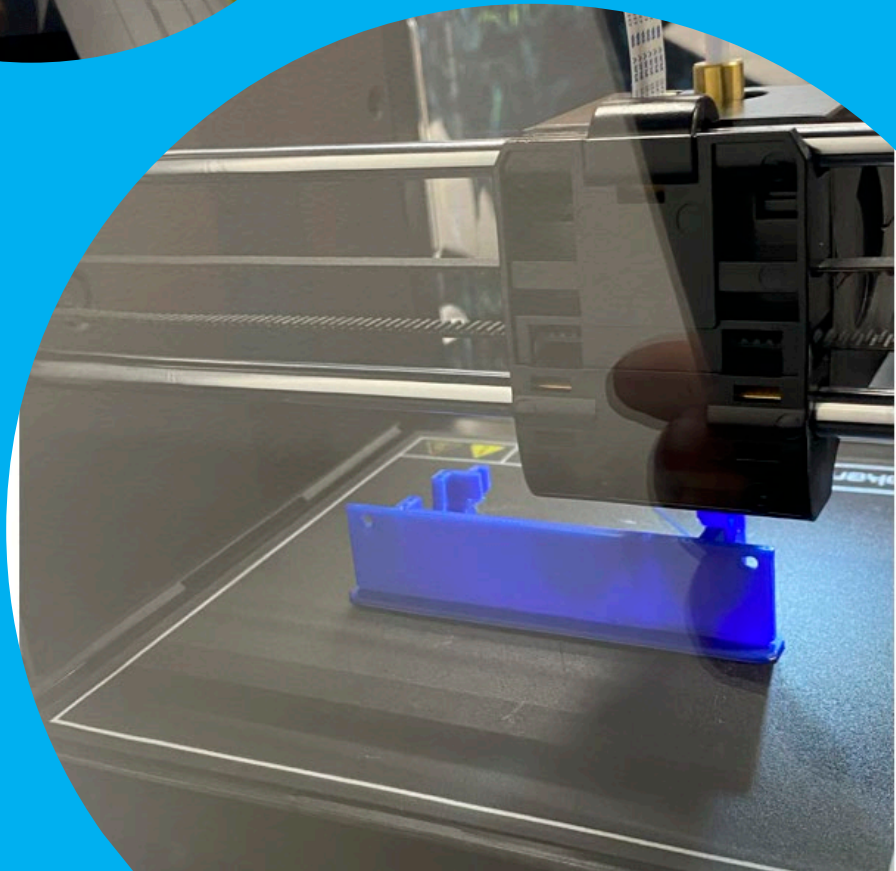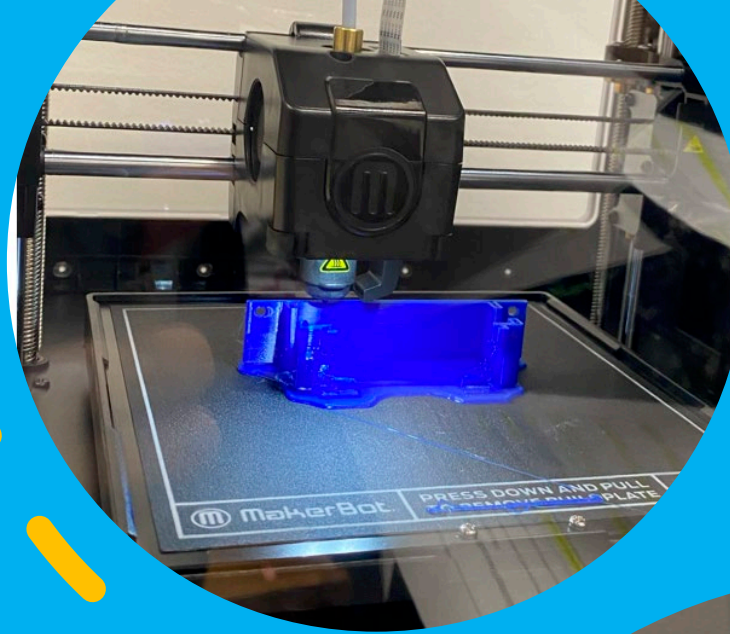
TESTING – DATA COLLECTION

We had 2 locations for our testing, and we did 4 tests in each, 2 with the lights off, and 2 with the lights on. Location was fine but test 1 flashed a frowny face instead of just showing it, everything else was just as planned. Location 2 was a little worse with the 3rd test flashing in between dimmed face and sad face and 1st and the 3rd test had the sound flicker on and off. The odd numbered tests are on, evens are off and those were perfect with no errors.
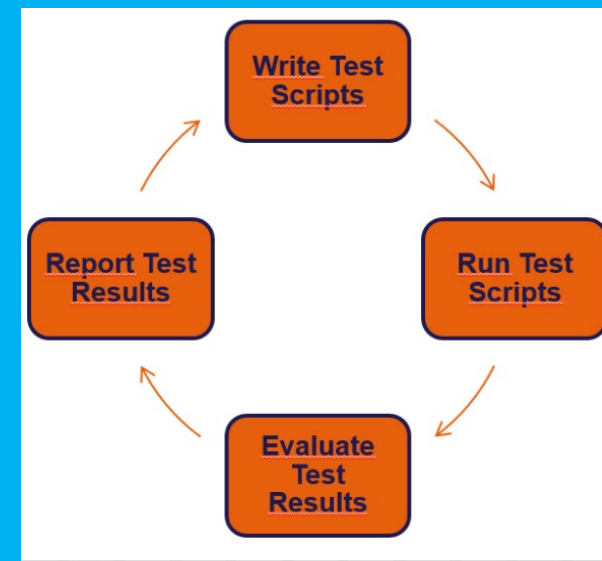
RESEARCH

Not everyone knows about the issue. Not many people are concerned about saving light energy. We decided to look up, "Where does Englewood's energy come from?" In 2021, Natural Gas and Nuclear Power fueled 90% of New Jersey's total energy.

TESTING

As a team, we designed the case to not block the sensor, allowing it to do what it was programmed for and let it work. We were also able to code an alarm for the Microbit.
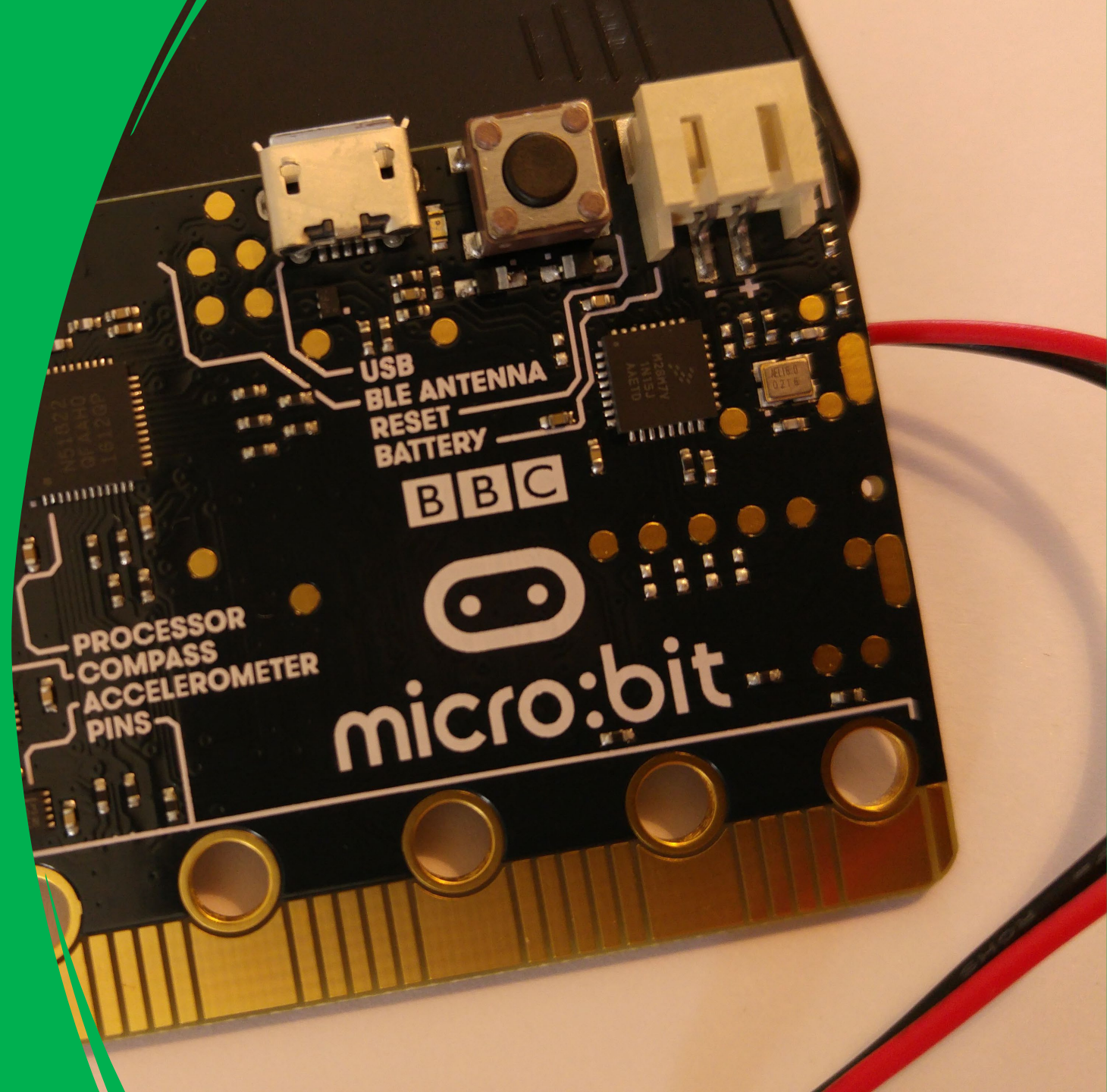
IMPROVEMENTS

We edited the Microbit's alarm system to make the alarm easier to hear and to make the alarm louder. We also tested two different locations. We also decided to remove the feature for dimmed lights after the presentation because it wasn't working properly.
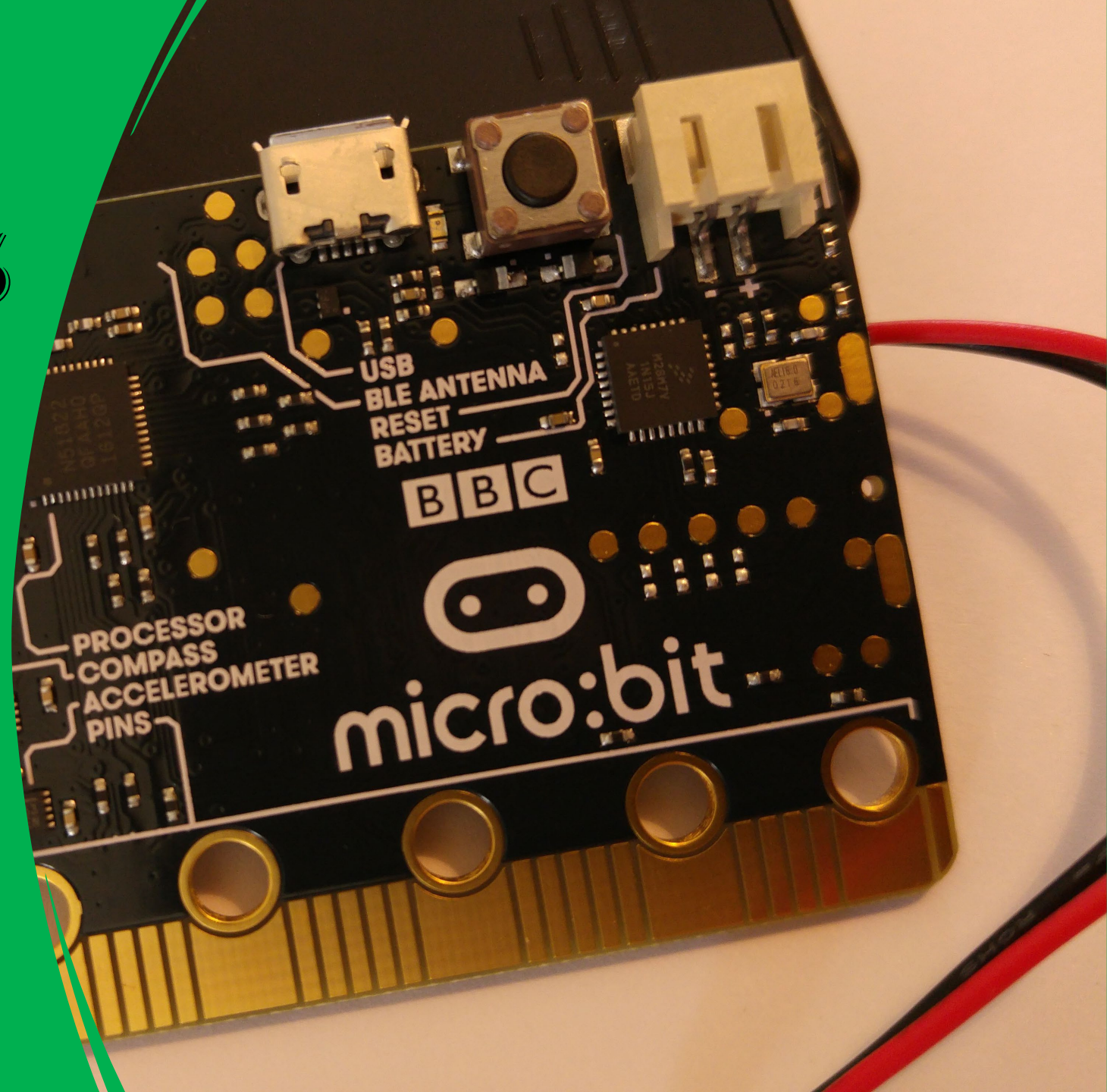
PROJECT TAKE-AWAYS: THINGS THAT WE LEARNED FROM THIS PROJECT!

Oliver: I learned how photons work, how important teamwork is, and I learned that coding could be hard or easy.

Ayah: I learned some websites to code, as in scratch and Microbit maker place.

Steven: I learned to test the microbit, and how to collect data.

Angel: I learned how to code a microbit, also I learned about saving light energy in the environment.

NJIT Experience

Gummy Bear Catapult

For the gummy bear catapult, we used gummy bears, rulers, rubber bands, and pencils. The point of this activity is to show students examples of physical engineering. We met two engineers that worked with the military, one of which designed a rocket for the military.

Outdoor Activities

At NJIT, they gave us a template for making a paper airplane. We were able to throw them, and they went really far. Aero engineering students helped us make them.

We also saw cool drones and we learned how they worked. We learned how the propellers are able to hold them up when the drones are in the air.

We were also able to see model planes and real cars. The cars were some of the ones that won really big races!

The model plane was cool, but it was not that big since it was not real.

There was also a wing, that was close to a plane, and it was about 16.5 feet long! That is really big!

Makerspace Scavenger Hunt

For the Makerspace Scavenger Hunt we entered a place that looked like a wood shop and we had riddles to find things like 3D printers or the woodshop, there was multiple levels to the Scavenger hunt and our team ended up finding one of the items that we needed to find first! We also got souvenirs like an NJIT badge! We also had a question about the names of the 3D printers in the Kahoot we did.

Presentation

At the time of the presentation we showed how the Microbit worked , and we presented this powerpoint. They also introduced themselves. Also we were team green there was also another team green that also presented. We told them about each slide. We talked about the Microbit and the problem. After our turn the other green team went.