# Arduino Challenge Response

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Everything Electronic's : Young Tech. Tigers Group

# Brainstorming Activity

- Arduino make a loud beep when you get to close to someone check distance be
- Squish approaching people
- Disinfectant spray thing on wheels – big loud speaker and it squirts disinfectant
- Put "your hands out" and squirt hand gel into hands for them
- Robot – with an arm and santiser
- Personality pleasant and engaging like Pepper robot
- Look like coronavirus
- Aim at busy spots – many need strong 4X4
- Walking robot capable of going up and down stair etc.
- Trunk bit with coronavirus body
- Hand gel
- Give away headbands project a 2 metre ring around you when worn
- Accompanying drone – message hanging down saying "hand gel here" also takes the headband across
- Motion sensor which is started if going to touch your face, it flashes and makes a noise
- Dispenses headbands one at a time.
- Rechargable
- Outdoor version with a solar panel
- Harlt robot with a drone
- Arduino for controlling the assembly of stuff
- Pepper to talk to the public and wear a coronavirus costume
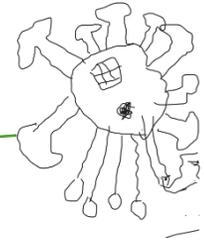
# Head and elbow bands

Down angled LED packs, double headband, front band carrying lights velcro-ed to cloth head band detachable for washing

Touch or magnetic switches make connection to warn that about to touch face, sends message to control unit

Arduino Nano 33 Bluetooth unit + mobile phone vibration unit + buzzer activated by message from the elbow touch sensors

Social distancing warning spots produced by angled LED packs

Note : elbow bands are capable of being used Independently of headband

# Head and elbow bands

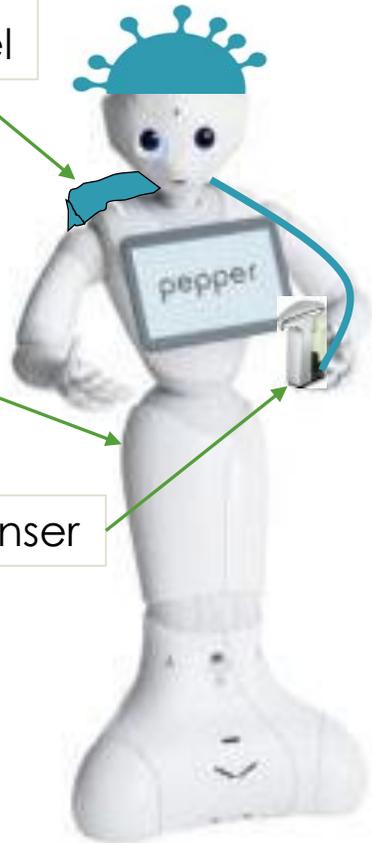1. **Head and elbow bands – social distancing & face touching**

   - Headband has four LED light arrays which shine a spot on the floor to either side and front and back to show correct social distancing.
   - Head band two layers, one containing lights and switch, Velcro attached to inner layer which can be removed for washing.
   - Elbow bands alert the person to the fact they are about to touch their face and must be capable of being worn over clothes or bare arms.
   - Arduino control unit worn around the neck and warns person if they are about to touch their face by buzzing and vibrating like a mobile phone does.
   - Sensor triggered via touch switches on elbow not motion. Blutooths to Arduino to start vibrating buzzer. Works by positioning the sensors correctly – in place which only touches if fully closing elbow to touch face.
   - Allows freedom of movement of elbow during exercise, crossing of arms, without triggering sensors.
   - Should be designed with fashionable  colours and fabrics. Elbow bands will need stretchy fabrics.

# Robot and drone gel dispenser group

Backpack to contain Spare hand sanitiser gel

Drone advertises groups presence, Possibly also dispenses head/elbow pack

**Hand Gel here**

Socially friendly Pepper Robot to greet people

Hopper robots carry spare sanitiser gel and one hopper contains packs of head/elbow bands to give away.

No touch hand gel dispenser
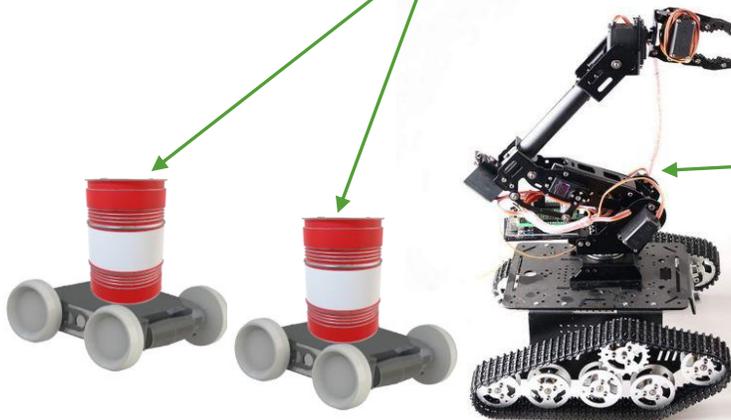
Arduino controlled Harlt robotic arm (scaled up). This coordinates the group's actions (see details), dispenses head and elbow packs, and cleans spilled hand gel

# Robot and drone gel and pack dispensers – hand cleansing

- Commercial robots carry and dispense hand gel in places where there are a lot of people coming by such as malls, railway and bus stations, park entrances
- Pepper robot gives a warm and empathetic greeting.
- Pepper carries hand gel backpack linked to a no touch hand gel dispenser.
- Drone flies over their heads following a signal from Harlt and then carries a head band and elbow band pack across to the person who wants one, alternatively Harlt drops it into waiting hand with its robotic arm. (2nd spare drone on charge).
- Hopper robots carry spare gel and the head & elbow band packs
- Arduino controls the following for the robot group:
  - Monitors how much hand gel is left in containers
  - Monitors their power levels
  - Has the data on the area and times they are patrolling and ensures they stay within these.
  - Instructs group to return to charging base for charging whenever necessary. Ditto for hand gel.
  - Instructs group to leave the base and start patrolling.
  - Controls the Harlt and hopper robots. Ensures drone remains on station.

# Technical and other issues

- Best way of delivering the headband to people? Would it be safe to be flown to them by a drone and dropped in their hands?
- Drone issue – very short flight times. Have got on on charge at all times would that work?
- Mopping the floor if gel spilled. Could we put something that would fluoresce in UV light into gel safely, and then have Harlt "sense UV light" and mop with its arm and a cloth??
- Type of light on headband – LED individual lights focussed into four spots or could a down angled LED strip give a circle of light? (preferred)
- Need portable charging centre – cameras on the robots – human overseer and robots come back here to recharge power and hand sanitiser
- If outdoors want robots to have solar panel recharging on their surfaces.
- Not sure how big the Harlt robotic arm is, but almost certainly would need scaling up
- Cost was discussed but as there was no set budget mentioned, CFG advised to ignore

# Cromar Future Group concept testing

- Would the touch switches work on the elbow pads ? : need them only to work when close to touching face as elbow fully closes, otherwise will irritate if closing too early when generally moving elbow doing other actions.

Control spots to show impact of wrong positioning of sensors

Sensor positions



Fully open elbow

Hand coming up to face sensors begin to touch, Good distance to face as warning signal sent.

Control spots disappearing

Hand at face sensors fully covered

Should work provided sensors positioned at either side of a broad band. Different sizes will be needed.