Computer Programming, Apps & Robotics

Year 5-6

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Flora illumina by Penny Ayres

What you need?

1 plastic tube, 9.54cm long and 2.12cm wide/ diameter (you can buy these from Bunnings in a long tube of 1 metre in the hose section)

Different coloured cables (You will need around 4 different colours and 64 of 75cm cables)

Relay module

Jumper cable

Different coloured robotics LED lights

A wire stripper

A soldering iron

Wooden board with small hole in the middle

PVA glue

A robotic uno/ the brain of the tree

A computer

Ardiuno app

And adult supervision and help

Yourself and an air conditioner to clear the air from the adhesive.

And any decorations to make your tree look decorative because it is a decoration

How it works light flashing tree
To make the tree lights flash:
Plug the battery connector into the battery and plug the skinny end into the small hole in the UNO after programming.

Amount of parental guidance
To make my tree I needed parental guidance to complete.
What I needed help with:

I needed help with glueing the base and the trunk to the wood block, if I did it on my own I could've messed up the circuits.
I needed to be shown what to do with soldering because if I did it wrong I could've burnt myself.
I also needed help with cutting the pipe with a saw.

Self complete
To create my tree:
Firstly I had to cut a 9.54cm pipe 2.12 in diameter.

Secondly I had to cut 64 wires of 75cm

Next I needed to strip the wires carefully or the wires wouldn't pass the electrical current.

After that, I needed to solder the LED's to the resisters to the cables

Next I needed to put the cables into groups. The black from one colour in one group, the green into one group, the black from another colour in a group, the yellow in one group, the black from another colour in a group and the red in a group, the black in a group and the blue in a group.

After that I needed to line up all the tips (each group separated) and carefully but accurately twist them.

Next I threaded the groups half way through the plain connectors and tighten the screw. Repeat for all.

Next I needed to make 4 red wires and 4 black wires and grab one black from the first group and a red from the second group and thread into one hole of the relay module, and repeat.

Then screw down

Next I grabbed the jumper cable and put it into the pins.
Then connected the jumper wire pins into the holes of the UNO board. The brown into the 5v and the red into the GRN. The blue into 13, the green into 12, the yellow into 11, and the orange into 10.

After that, I plugged the USB into the computer and the UNO board. I used the arduino app to program it. I dragged the INT into the middle and changed the boxes into the colours and value as the number pin it's in. All you need to do is clone and change.

Then dragged out digital write into the loop. And then I delay ms into the bottom of the digital write. Type the colour .Change delay to 2000 for 2 seconds for the light to be on. Then I cloned and moved underneath and changed colour.

Next take out USB and then plug in the battery connector with the battery attached.

After that I pulled the lights attached to the cables through the trunk and glued the base to the wooden board and glued the trunk to the base. I used a hot glue gun.

After that I decorated my tree with branches out of wire and used synthetic fabric leaves. I hot glued them. I also hot glued synthetic grass to the base to cover the wood board as decoration.

By Penny Rose Ayres
Oliphant Science Competition Entry
Immanuel Primary School

How to make a colour changing tree 🌳

You will need:

1 plastic tube, 9.54cm long and 2.12cm wide/ diameter (you can buy these from Bunnings in a long tube of 1 metre in the hose section)

Different coloured cables (You will need around 4 different colours and 64 of 75cm cables)

Relay module

Jumper cable

Different coloured robotics LED lights

A wire stripper

A soldering iron

Wooden board with small hole in the middle

PVA glue

A robotic uno/ the brain of the tree

A computer

Ardiuno app

And adult supervision and help

Yourself and an air conditioner to clear the air from the adhesive.

And any decorations to make your tree look decorative because it is a decoration

This decoration can light up any room and can demonstrate your ability to create/ make your own robotics.
This can demonstrate your imagination.

Please enjoy the process.

METHOD:

Step 1
Saw a 9.54cm long piece of 2.12cm in diameter tube

Step 2
Cut 64 cables of 75cm and four colours. Make 32 black and 32 in the 4 different colours. Then strip them.

Step 3
Danger! With an adult, solder the resisters onto the ends of the coloured end. Then solder that to the LED lights.

Step 4
Sort the cords into colours, black, yellow blue, green, blue.
Colours separate.
8 groups.

Step 5
Group them.

Step 6
Twist the ends of all the cords in each group.

Step 7
Thread the different groups half way through the connectors.

Step 8
Screw down the screws.

Step 9
Cut 8 red and black cables 4 of each.

Step 10
With a jumper cable with 6 wires, plug the brown wire into the 5 volts hole, , the red into the ground, the blue into the 13, the green into 12, the yellow into the 11, and the orange into 10.

Step 11
Plug USB into the computer and uno, and open the free arduino app.

Step 12
Go into controls and drag the program out

Step 13
Drag the INT into the upper box

Step 14
Change the top part to red and 13 on value

And clone, and change to yellow and value 12
Clone, and change to green and value 11
Clone and change to blue and value 10

Step 15
I figured out how to make the lights go on.
Don't let the lights touch otherwise it will short circuit the lights

Step 16
unplug the USB and prepare the battery with the battery connector.

Step 17
Put the lights into the trunk

Step 18
Glue the trunk to the board. Then plug in the battery and battery connector.

Step 19
Decorate your tree. You cash make it weeping or it can be a straight tree. Make branches or leave it weeping. Do your own style.
Find a great place to display your tree

Step 20
Enjoy your flashing tree. Don't let