



Highly Commended

Models & Inventions

Year 7-8

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Written Report for Joystick Mouse

This is a project developed by James Cree and Oliver Fenton from year 7, Prince Alfred College, Adelaide.

We made a joystick mouse to test our coding, wiring and 3D printing abilities. We were interested in this because we had been learning Arduino code and one of us has bought a new 3D printer.

The joystick moves the cursor and the scroll wheel works like a normal scroll wheel. The left click button is on the joystick, and the scroll wheel no longer clicks.

Scientific Principle Demonstrated

As coding, hardware and 3D printing were required, the scientific principle demonstrated was computer science. Computer science involves engineering, logic and mathematics.

How the Entry was Made

Hardware

Making the mouse started with hardware; the electronics, wires and parts.

We purchased an Arduino starter kit to experiment with. A joystick was included, and we wondered if a mouse could be made with it.

We used a rotary encoder to scroll. We also bought an Arduino board that would move the computer cursor.

Software

We installed Arduino IDE on our computers so we could write code for the mouse.

3D printing

To design our 3D print model, we used Solidworks, and made a box to contain the mouse hardware. As the printer works in layers, we 'sliced' the model using 'Cura slicer', to cut it into slices and to make the file readable by the 3D printer. The first two models had some issues, but the third was better, and we were able to use the design as the final product

Process

After assembling the parts, we researched the internet for code. None of the code we found did what we wanted it to, so we had to use parts of it and add our own code to it.

We trialled the code to see which parts worked. We kept changing the code until we were satisfied with it.

After we were happy with the code and the parts, we moved on to the 3D printing aspect of it. One problem we had with printing was getting the design right. We succeeded on our third try, but still had to make some minor adjustments.

Problems We Overcame

We had to use several problem-solving techniques to find the answer to these issues.

There wasn't a code on the internet that did what we wanted, so we got creative and wrote our own.

The Arduino board originally used didn't have the crucial library <Mouse.h>, which was required for the push button on the joystick. We bought a new board with the library.

Unfortunately, during the final assembly, the scroll wheel broke, and would not click, so we changed the left click to the joystick and, as we only had one button, discarded the right click.

Final Product

We developed lots of skills making this and ended up with a functional mouse. We tested it, but discovered that the joystick is hard to control, and a conventional mouse is easier to use.