

## PTkai: 03: Intro: What is Designing and developing digital outcomes?

Video Name: Using Picaxe in Digital Outcomes

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I started this year in the intermediate technology department trying to introduce the digital technologies curriculum by doing physical programming with a little microcontroller called a Picaxe. I was involved in a Ministry pilot last year with Andrew Hornblow from Bright Sparks who's had a lot of experience programming with little 8 pin microcontrollers. That was great professional development for me.

What we've been working on with the Picaxe is teaching kids the basics of the digital technologies curriculum: that programming involves the sequence of what the code is, selection, (creating 'if' statements and branching), and then the basics of electronics so using how does electricity work in a circuit, what are the different components you could add in, and different things you could do.

With those children and some others from last year we came up with various projects. This one was painted by my daughter, I'm not this good an artist. She's created a fortune telling monkey. You ask it a question and it will come up with the answer. Here's the input, a couple of little drawing pins down here. You touch them. The question is "Am I the best teacher in the world?" It of course said 'yes'. Well done fortune teller.

The children build the circuit. They build the housing for it and I supply them with most of the code but they get to play around the edges, look at the 'random' code generation, see how that works, program how long the LEDs stay on for. Playing around with sounds, a lot of kids are fascinated by programming different sounds. This one uses a touch capacitance aerial that when your hand touches it it changes the capacitance. You just match that to a tone on the major scale. So for example [machine beeps different notes as he moves his hand on the aerial]. Kids have had fun playing around with programming that. It's got a few other features as well.

This is a digital thermometer project. It's got a little thermistor sensor on the end of a wire. You could hang it outside the window to measure the outside temperature. It's got a thermistor on the inside to measure the inside temperature. It was a piece of code from Andrew Hornblow again that when you push the button it blinks out the temperature in 10s and 1s. Long blinks for

10s and short blinks for 1s. That one was measuring 20 degrees and I think the bottom one might have been 18.

I'm finding this really exciting using the Picaxe because there is just so many sensors and modules that you can incorporate.

This one's your standard passive infrared sensor that you see on outside automatic lighting. We can incorporate that to make a nightlight so when people go past and the light drops on the light sensor it should turn on the nightlight. It takes a while for the PIR to adjust and if I stop shaking it around at any moment it should turn on. You can edit this bit out later. Perhaps it's because we are so still. There we go. Turns on the light and then you program it for the duration. Then it will switch itself off.

We use this other one, this one's quite popular amongst the boys. They program some sort of sound so that when someone walks past [an alarm sounds]. It could act as an alarm system.