Student 6: High Not Achieved

NZQA Intended for teacher use only

My Family





I was born in New Zealand. My father, a Māori by ethnicity is a dairy farmer. My mum is who is from England, stays home and helps in the family business. I have 2 brothers who are elder than me. We often have family gatherings with both my mum and dads whānau and we often cook meals to cater for both families.

Food important to Dads culture – Hangi, sea food, vegetables
Food important to Mum's culture - Fish and chips, cottage pie, scotch egg, apple crisp


To design a food product that reflects the history of my family and represents my family. We get to find out more background information about my family's history and the more we know ourselves makes us more strong designers and also makes us better with making our own recipes, more skills in the kitchen.

The members of my whānau who are giving me feedback are my dad, mum and my older brother. My friends, [redacted] and [redacted] and my teacher will also help me develop my product with taste testing's and advice on my cooking.

After interviewing my whanau, alongside the specifications from my teacher, I need remember to

- Include cultural ingredients commonly used in the following countries: England and NZ Māori
- Use cooking techniques typical of these countries, such as: Roasting, stewing, frying, Hangi
- Keep the spice/heat tolerance as: mild
- Not to include gluten, tofu, eggplant and olives as these are ingredients members of my whanau won't eat
- Include one/some of these favoured ingredients: Dairy, chilli sauce or fried rice

Idea 1 : mac & cheese

I chose this because my mums side of the family really enjoys such foods and it will be nice

- 300 g macaroni
- 30 g butter
- 25 g flour
- 500 ml milk
- 200 g cheddar cheese
- Bread crumbs.

Boil water and cook macaroni. 2. Make cheese sauce by combining butter, milk, flour and cheese. 3. Mix the macaroni with the cheese sauce and then put it into a tray with some extra cheese and bread crumbs on top. 4. Leave in oven at 200 degrees until the top layer turns crispy and then serve with a sauce of your choice.

Evaluation

What do you like about this idea. I like this idea because it is easy to make and quite tasty and my mums family will really appreciate it.

What do you dislike about this idea. I dislike the fact that I have had it a lot and its not something different to what I eat heaps and that my dads side of the family doesn't really eat foods like this much

How could i change this idea. Next time I will add some more herbs and spices to make it more flavoursome

Results. Our mac and cheese cooked nicely and our process went smoothly, it smelled nice, it was a yellowy colour because of the cheese.

Reflection

Feedback from classmates said

It was very bland and plain

Lack of flavour

Idea 2 : cheese toasted sandwich

This will be enjoyed by my dads side of the family because they really like foods with lots of ingredients involved.

- White bread
- Tinned spaghetti
- Grated mozzarella cheese
- Canned pineapple
- Ham
- Butter

Put all the toppings on a piece of bread and then once all toppings are on there, put another piece of bread on top of everything and put it in the hot sandwich press until golden brown.

Evaluation

Results. Not cooked properly and lots of topping fell out, it was a brown colour but it actually smelled nice even though it didn't really taste great

Feedback from classmates
Stale and flavourless and it was quite messy

Idea 3 : cheese burger

This cheeseburger will be enjoyed by my mum and my dads side because this burger consists of ingredients liked by both sides of my family

- Brioche buns
- Tegel Free Range Chicken Burgers Crunchy Breast
- Wattie's burger sauce
- Cheese slice, Lettuce
- Tomato
- Beetroot
- Pickles
- butter

Mince chicken breasts and cook in a frying pan on medium high heat, toast buns in oven on fan grill until toasty, add toppings and sauce to buns and then add the chicken.
Serve!

Evaluation

Results. it cooked well and our process was good, but the taste wasn't that great

Feedback from classmates
Not very eye pleasing.
Tasty, nice texture and flavour

My evaluation.

What do you like about this idea? The simplicity and goodness of the burger

What do you dislike about this idea? Cooking chicken because it can be dangerous and difficult.

How could I change this idea? Cook chicken as a whole breast instead of cutting it up

Final Product Recipe

Fried mozzarella sticks

- 2 large eggs, beaten
- ¼ cup water1
- ½ cups Italian seasoned bread crumbs
- ½ teaspoon garlic salt
- ⅔ cup all-purpose flour
- ⅓ cup cornstarch
- 2 cups oil for frying
- 1 (16 ounce) package mozzarella cheese sticks

Cut cheese into sticks, dip cheese sticks in flour then egg then breadcrumbs seasoning. Put battered cheese sticks into the frying pan on high heat until a crispy outer layer forms and eat.

Evaluation

Our deep fried mozzarella sticks turned out better than expected with a nice crust on the outside and beautiful melted cheese on the inside.

Our peers enjoyed our mozzarella sticks and I will be making them in the future. They were served on a nice plate with some tomato dipping sauce if you wanted it but in my opinion they tasted better on their own.

We decided to make this because it is the ultimate cheesy food, it's about as cheesy as it gets.

Products fit For Purpose

I designed and made my product for my mum because she really enjoys cheesy foods. I designed this to fulfill her enjoyment for cheese

The specifications were:

Specification 1: crispy outer layer
Meet Yes/No

Specification 2: stringy mozzarella cheese inside
Meet Yes/No

Specification 3: tidy looking mozzarella sticks
Meet Yes/No

Specification 4: flavour other than just cheese
Meet Yes/no

My Product meet these specifications because it had a nice crispy layer on the outside of the stringy mozzarella cheese

My Product did not meet these specifications because they were in weird shapes and sizes and not very tidy and were kind of plain and cheesy

If I were to redesign this product I would change the seasonings and add some more tasty products to give it some more flavour.

Introduction

Fishing is an important part of the Maori culture because they needed food and they used fishing as a main source of food. Maori are connected to the sea spiritually and so the sea is important to the Maori culture. They also have a god for the fishes and the sea so the sea is important in their culture for myths and legends

The bait fish storage system uses a piezo buzzer, LCD, Arduino Nano and a button and a thermometer. You have to use the buzzer to signal that the box is open and the LCD shows the temperature and we get the temperature because of the thermometer. The Arduino Nano codes the equipment to do what we want it to do. You have to use the safety glasses to protect your eyes when soldering pieces together. Don't burn each other, wood or flammable materials

The Arduino that we are using is the Arduino nano. An Arduino puts out commands that follow our code to the electronic equipment and the equipment will follow the commands within it's abilities. For example you can make a speaker play sound at certain loudness but you can't make it become a sensor and detect objects. The Arduino needs a power source to put the commands to the equipment and to get the same commands to multiple objects at once with a breadboard so you can power more things at once.

Design Thinking and Brief Development

The bait box is meant to be waterproof so the customer doesn't have to worry about it breaking or rotting the bait from the inside. The Bait box has electronics for a cooling system so the box must be watertight so they ain't broken and short circuited. To keep the Bait box cool we use a fan and a thermometer to tell if it to hot

We question the stakeholder because the outcome might be different than they imagined and then the function of the Bait box won't meet the specifications of the stakeholder.

The materials that are needed for the Bait box must be sustainable so that the Bait box is good for the environment and doesn't damage it and the animals in the ecosystem. We do this by using materials that are plant based so we can grow them and not have to look for them under the Earth. These resources still have to func

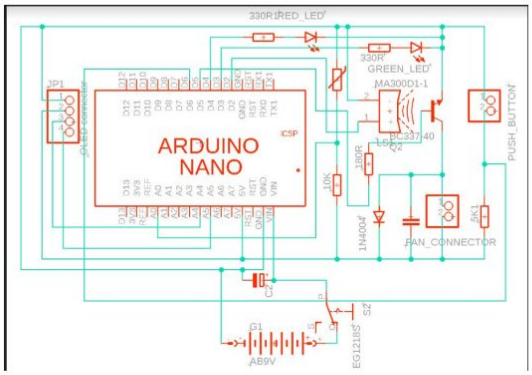
https://bootcamp.uxdesign.cc/design-thinking-process-b64aca6d4a6a

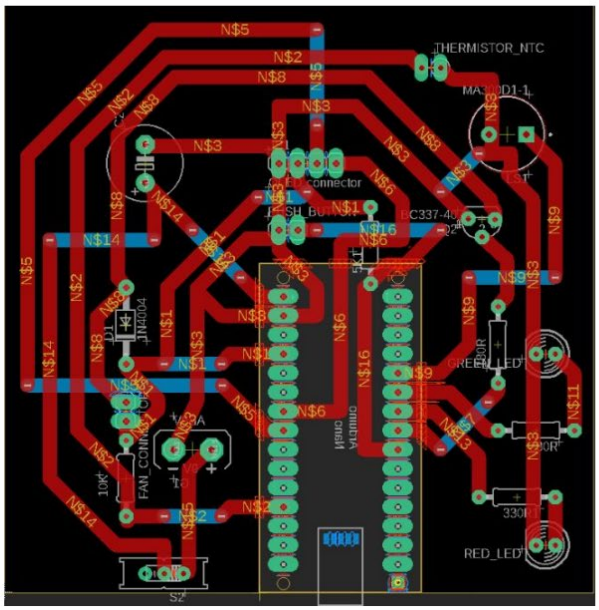
To get ideas for the Bait box we used Design Thinking Process to see what was needed for the Bait box.
EMPHASIZE: To get the ideas we used a questionnaire and questioned the stakeholder
https://docs.google.com/document/d/1tdYkcbSgK7GOZQNeXDDJCJZXRnWVOkZ0iq9xy_UPY5s/edit
DEFINE:
We used the Emphasise phase we knew what the problem with the bait transportation and storage was between multiple people to reduce a common inconvenience.
IDEATE: The mind map was created by using the website mindmeister. This helps us visualize the problems with the bait when going fishing
(https://www.mindmeister.com/map/2816473565)

Materials and Equipment Selection

To make the box we need to use a strong material that is eco-friendly as well as able to function for a lot time so for that reason we are going to you biodegradable plastic. Plastic is a famous material because of its uses and how it lasts long. The problem is that it isn't biodegradable so it is harmful to the environment. To use biodegradable plastic will give us the benefit of plastic and get rid of the negatives of it. The plastic will also not interfere with the electronics so we don't have to worry about them. To get the electronics and the right placing for them comes for the schematics on the slide below (the next slide). Before using the equipment for the Bait box we tested them to make sure they work so we know that if the first test of the Bait box fails we know it isn't the equipment themselves. We also learnt that codes to operate the equipment and what each code does for each equipment.

Materials and equipment selection: Schematics





Material and Equipment selection (continued)

From slide 8 to 17 is a list of equipment used for the Bait box storage system

The Arduino nano is a smaller version of the Arduino uno so it saves space for other equipment in the Bait box. The Arduino nano gives a list of instructions for the equipment to use and under certain conditions should they do something else like the fan only blowing air at a certain temperature otherwise it doesn't move

Material and Equipment selection (continued)

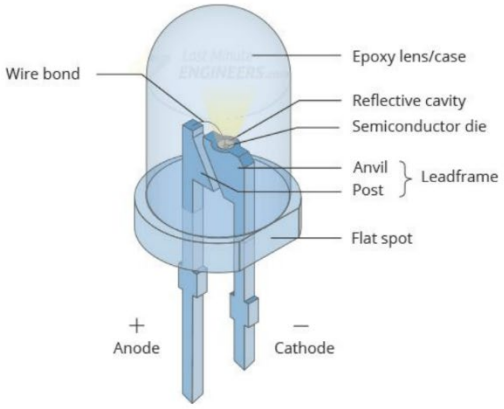
We use red and green LEDs to tell us if the heat in the Bait box is going to spoil the meat or not. The red tells us the Bait box is too warm for the meat and green tells us that the Bait box is cool enough for the meat.

LED P/N Suffix	Description	Chemistry	# of Elements	Color Temperature (CCT Typ)	Peak Wavelength (λ / x-coord)	Dominant Wavelength (λ / y-coord)	Forward Voltage (Vf Typ)	Forward Voltage (Vf Max)	Brightness
H	High Efficiency Red	GaP	2	~	700	650	2.0	2.5	Standard
SR	Super Red	GaAlAs	3	~	660	640	1.7	2.2	High
SR	Super Red	AlInGaP	4	~	660	640	2.1	2.5	High
SI	Super High Intensity Red	AlInGaP	4	~	636	628	2.0	2.6	High
I	High Intensity Red	GaAsP	3	~	635	625	2.0	2.5	Standard
ZI	TS AlInGaP Red	AlInGaP	4	~	640	630	2.2	2.8	High
SO	Super Orange	AlInGaP	4	~	610	602	2.0	2.5	Standard
A	Amber	GaAsP	3	~	605	610	2.0	2.5	Standard
SY	Super Yellow	AlInGaP	4	~	590	588	2.0	2.5	Standard
ZY	TS AlInGaP Yellow	AlInGaP	4	~	590	589	2.3	2.8	High
Y	Yellow	GaAsP	3	~	590	588	2.1	2.5	Standard
SUG	Super Ultra Green	AlInGaP	4	~	574	568	2.2	2.6	High
G	Green	GaP	2	~	565	568	2.2	2.6	Standard
SG	Super Green	GaP	2	~	565	568	2.2	2.6	Standard
PG	Pure Green	GaP	2	~	555	555	2.1	2.5	Standard
UPG	Ultra Pure Green	InGaN	3	~	525	520	3.5	4.0	High
UEG	Ultra Emerald Green	InGaN	3	~	500	505	3.5	4.0	High
USB	Ultra Super Blue	InGaN	3	~	470	470	3.5	4.0	High

The picture on the left shows us the Red and Green LEDs maximum voltage of 2.2 for the Red LED and 2.6 for the green LED. We need to know this because the Arduino nano gives out 5V which will wreck the LEDs. With the picture on the left we know that we need a resistor so the LEDs doesn't explode.

https://electronics.stackexchange.com/questions/389726/whats-the-difference-between-typical-and-maximum-forward-voltage-for-an-led (this website is where we got the LEDs maximum voltage

Parts of LED



https://lastminuteengineers.com/light-emitting-diode-led/

Resistor (used to protect LED)

The Arduino nano outputs 5V which will cause the LEDs to stop working so the solution to this problem is to put resistors into the circuit so the LEDs don't get a rush of electricity all at once but let the electricity go at a slower pace and also the Arduino nano will still put out 5V

The equation of resistors

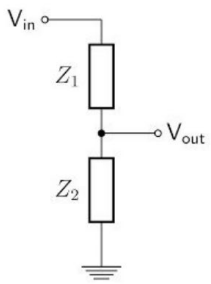
V=IR

Voltage = V, Current = I, Resistance = R

V/I = V

To find the LED resistor for the circuit
R=Vs-Vled/I led
R=5-2/0.02
R=3/0.02
R=150 ohms
Vs = Supply voltage from arduino = (5V)
Vled = LED voltage (from datasheet)
I= current of LED (0.02amps from datasheet
R=Resistance value of resistor

https://en.wikipedia.org/wiki/Voltage_divider

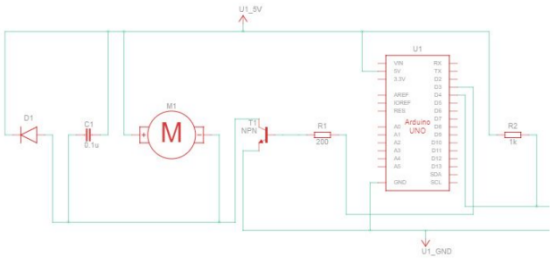


Thermistor: A thermistor does the same thing as a variable resistor but it also changes and tells us the temperature when it rises or drops. The formula of a thermistor is shown by the bottom photo

If we put a thermistor where Z1 is, we can create a tool that can tell us the temperature because of how the Vout will change depending on the temperature.

$$V_{\text{out}} = \frac{Z_2}{Z_1 + Z_2} \cdot V_{\text{in}}$$

Materials and Equipment selection (continue)

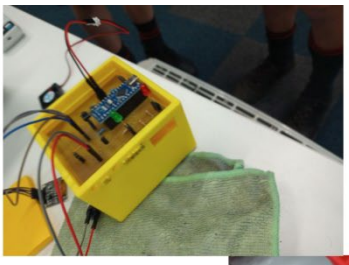
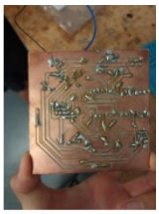
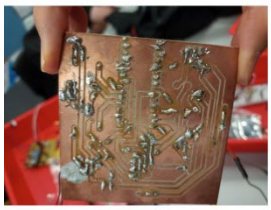
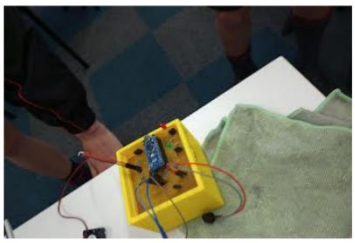


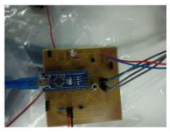
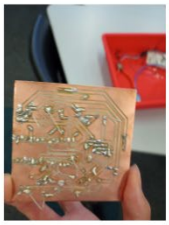
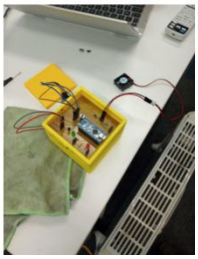
The diagram above shows us the fan motor, the transistor, the diode D1, the capacitor C1 and the base resistor R1. The diode D1 stops electrical current from going backwards which would damage the transistor. The capacitor C1 absorbs electronic noise, which is disturbances in an electrical signal, that might be produced by the fan motor. The base resistor R1 is to block the voltage from 5V to 0.7 which is needed by the transistor

The Fan motor used has a 5V voltage rating and the 200 milliamps maximum current rating. The transistor chosen depends on this information as it needs to be able to handle the current. Therefore I have chosen the BC337 transistor as it can handle 800 milliamps according to the datasheet Ic=800madc

The fan motor can safely take 5V and 200 milliamps. The transistor needs to be able to handle these currents so the transistor chosen was the BC337 transistor which meets our standards according to the datasheet Ic=800madc because it can withstand 800 milliamps.

Circuit production and prototyping


Bait box designing process