National Certificate of Educational Achievement
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

Exemplar for Internal Achievement Standard

Technology Level 2

This exemplar supports assessment against:

Achievement Standard 91356 (A)

Develop a conceptual design for an outcome

An annotated exemplar is an extract of student evidence, with a commentary, to explain key aspects of the standard. It assists teachers to make assessment judgements at the grade boundaries.

New Zealand Qualifications Authority

To support internal assessment

	Grade Boundary: Low Excellence
1.	For Excellence, the student needs to develop a justified conceptual design for an outcome. This involves: • synthesising evidence from ongoing research and functional modelling, including feedback from stakeholders, to evaluate conceptual designs • substantiating the outcome's potential fitness for purpose. This student developed a conceptual design for a recipe card to be given out with a food parcel. The student used advice from a relevant technologist as a starting point, and showed some evidence of synthesising this information with the results of their own testing of recipes, analysis of a range of recipe layouts and feedback from other people to inform the developing conceptual design (1). Feedback from functional modelling also formed part of this synthesis of evidence to evaluate conceptual designs (2). Other feedback contributed to the development of design ideas (3), the validation of recipe choices (4) and recipe format (5). The student substantiates the outcome's fitness for purpose (6). For a more secure Excellence, the student could have included more evidence of key stakeholder feedback (i.e. food bank personnel) to validate the decision making that was occurring.

(1) From talking to a technologist, I learnt that I needed to: understand budgeting to keep recipes low cost and use staple foods; have a commitment to quality by testing all recipes; ensure the recipe is fit for purpose by having correct processes and quantities; consider the target market - their feedback is very valuable; etc.

This was supported by the information I got from food bank suppliers. They said that users who are unable to provide food for themselves or their family need to have foods that are cheap and that can be cooked easily, but also foods that they prefer to eat. I also found out that I need to consider that those who receive these food parcels sometimes come from different cultural and religious beliefs and may have little or no reading ability as well as little or no cooking equipment.

The technologist also stressed the importance of a user friendly layout that included photographs of all recipes to ensure clients can see end products. I therefore analysed a range of layouts to realise the best format for clients. I concluded that the MenuMade format or 'Recipe Analysis #2 is the ideal recipe format to use for the users of the food parcel. This is because this recipe format could be used by anyone with or without culinary cooking experiences. MenuMade recipes use limited cooking jargon and are compressed into one page. I thought the one page idea was very good, as it takes away turning pages for recipes in the kitchen, which can get messy. It was important that I included in my recipe a format with similar features to MenuMade, eg to follow, number of servings, photo, step by step instructions, serving suggestions, etc. Because I am producing six recipes it is important that all recipes are formatted the same way to avoid confusion by the people using them. The recipes do include lots of information that probably shouldn't be necessary for my users, unless it is rather essential to benefit them greatly.

Through research (for example, http://www.quintcareers.com/resume_fonts.html), I have found that fonts are a very important factor in any presentation. I have applied this information to the recipes to be given to my clients. This is because I have found that the use of fonts can either encourage or discourage reading habits.

(2) "The chicken is a little over-cooked."

"The noodles are a little bit soft but not a problem as it is from an instant noodle packet which can be cooked easily."

"Using powdered stock instead of liquid would make the recipe cheaper to make"

"The meat is a little dry and hard – the cooking time could be reduced."

(3) "It is good that the recipe format has specified time frames like preparation and cooking time, as well as indication for its difficulty, cost and its serving. I think the photos should be made larger so that it can be seen easier. Since most of the writing is enclosed and crowded on the left side of the recipe, there is a lot of empty space in the right side. I suggest that the photo be increased and moved so that there is a balance in the overall layout of the recipe."

~ BROCCOLI CHICKEN FETTUCCINI ALFREDO

PREPARATION TIME: 15 minutes
COOKING TIME: 35 minutes
DIFFICULTY: Medium
COST: Medium RECIPE SERVES: 4

STEPS:	INGREDIENTS NEEDED:	INSTRUCTION:
1.	1x skinless, boneless chicken breasts	Cut chicken breast meat into bite size pieces, trimming any fat off in the process.
2.	1x onion, finely chopped 2x tablespoons butter 1x skinless, boneless chicken breasts, cut into small pieces, fat trimmed	Sauté butter chopped onions and chicken breasts in a saucepan.
3.	200 g dry fettucine pasta boiling water	In a separate saucepan, cook pasta in boiling water.
4.	1 (10.75 ounce) can condensed cream of mushroom soup	Combine mushroom soup in the onion sauté, with the cheese. Stir altogether.
5.	1 cup fresh broccoli, chopped	Add the broccoli and then return to the boil for 5 minutes or until broccoli is cooked.
6.		Reduce heat; simmer, stirring occasionally, for 5 minutes.
7.		Drain cooked pasta. Add into broccoli mixture.
8.	1 cup grated parmesan cheese	Top with cheese, and serve at once.

(4) "It's Asian flavours added to the dishes exceptional taste."

"Good nutritional value for the consumer."

"An exceptionally great source of carbohydrates, protein and fibre."

"The dish is very filling which makes it ideal."

"The recipe is easy to use."

(5) "Cooking a lot of meals is certainly demanding. The new recipe format is a lot easier to read since I know which key ingredients I need for each step. Also, things like 'preparation time' and 'cooking time' are very helpful."

(6) The following points are based on the requirements I established for producing a conceptual design.

Recipes must be easy to make.

People who trialled my recipes had a range of cooking ability. They agreed the recipes were easy-to-make meals. They would therefore be suitable for my main stakeholders who may not have culinary experience to execute complex and hard recipes.

Must be the normal foods/ingredients found within a food parcel. Extra foods/ingredients to be bought must be listed.

The majority of the foods in my recipes are included in the food parcel; mostly staple foods. I capitalized on the most common ingredient – carbohydrates (pasta and rice) – found in the food parcel and used it as the base for most of my recipes.

Although I included other ingredients; I tried to make them ingredients that were cheap and easily available. I decided that there was not a lot of value in listing them as food parcels vary in each branch.

The recipes need to specify the number of servings, eg serves 6.

My recipes indicate the average quantity of servings the dish can provide.

Recipes must be easy to read.

Feedback and extensive research has indicated that my recipes follow a format that is easy to read. I chose the format arrangement to make the recipe's interpretation, execution and application easier and more efficient, as my stakeholders do not have to look back at the 'ingredients needed' table when reading the methods.

Recipes must be durable.

I suggest that the recipes are laminated so that they can be wiped over etc. I will also include a CD with the recipes, although I realise users may not have ready access to a computer and printer.

Recipe layout must attract the reader in a positive way

My research made me decide to use green as much as possible. It is the colour of harmony, balance, refreshment, universal love, rest, restoration, reassurance, environmental awareness, equilibrium and peace – all things that I think would be good for my users. Green strikes the eye in such a way as to require no adjustment whatever and is therefore restful. Being in the centre of the spectrum it is the colour of balance. When the word about us contains plenty of green, this indicates the presence of water and little danger of famine so we are reassured by green.

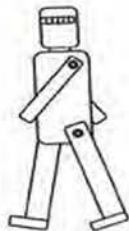|	Grade Boundary: High Merit
2.	For Merit, the student needs to develop a refined conceptual design for an outcome. This involves: • ongoing exploration and evaluation of design ideas to determine their suitability for inclusion in conceptual designs • using evidence from on-going research and functional modelling, including feedback from stakeholders, to evaluate conceptual designs. This student developed a conceptual design for a sturdy toy for a young cousin. The student explores and evaluates existing toys and parts relevant to toy design, such as steering assembly, motors, reverse relays and material items to determine their suitability (1) (2) (3). The student interviews a key stakeholder to seek opinion of a functional model demonstration for further on-going research (4). To reach Excellence, the student could justify the conceptual design's potential fitness for purpose as defined by the brief.

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Please note: The evidence presented in this exemplar provides snapshots of student evidence. The commentary aims to link the student evidence which for this standard was 40+ A4 pages.
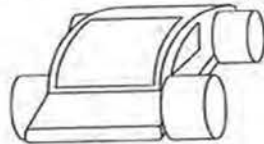
The student brief was confirmed by the teacher:

"To develop a conceptual design of a sturdy toy that would entertain a young cousin at his grandparent's house.

All of the products move in a different way. The cars drive, the helicopter flies and the dinosaur walks. All of these ways of moving would suit a solution I make, but some are easier to do than others. A flying solution would defiantly look good but I don't think that it would be practical for young children. Again walking would look quite good but wouldn't be practical for young children. I think I shall take driving further as it would still look good in action but it will be a lot more practical for young children, and be easier to make.

Concept 2

Concept 3

Concept 1

②

Please rank my 6 designs in order of importance:

Which concept appears to be the sturdiest?	2	6	5	1	3	4
Which concept do you think will appeal to your grandchildren?	3	2	5	6	1	4
Which concept is best suited to indoor and outdoor use?	2	5	1	6	4	3
Which concept would be easiest to store?	4	2	6	3	1	5

From the results of this screening I will develop design 2

Specifications included:

- Sturdy
- Can be manoeuvred
- Remote controlled
- Battery powered
- Can be used indoors or outdoors
- Can be easily stored

②

The student provided evidence of the following steps in his practice:

He talked with his grandparents to establish any constraints and so he had a personal understanding of the problem

⬇

Researched existing remote controlled toys and gained feedback from his grandparents and then used this research to inform his design ideas.

⬇

Presented first design ideas in the form of 2D sketches to his stakeholders and gained feedback by using a concept screening chart

⬇

Based on stakeholder feedback developed the selected design idea by freehand sketching his ideas for the toy and then made a cardboard model to test proportion and size.

⬇

From his research the student discovered that colour and simplicity were two factors in children's toys. He explored a range of materials to look at possibilities of materials as the type and performance property of the material may constrain the design of the toy itself.

①

Concept development

Car shape

The shape of the car is very important as if the car looks good then it will attract the attention of my cousins. This is why I need to make sure my car is looks very good. I have researched pictures of sports cars and will incorporate designs into my car. I could sculpt the design into wood or foam quite easily then attach it to the basic design of my car which I will probably make out of plastic.

There are three main parts of a car that makes it look good. The shape of the roof, the shape of the spoiler and the shape of the front of the car. I have drawn concepts for what the shape could look like. I will decide which one is best and why, and then I will model it.

②

High Performance Thermoplastics (HPTP):
Plastic materials fall into two basic categories:
Thermosets, which can be molded only once, and
Thermoplastics, which can be reheated and remolded several times

High Temperature Performance
Maintains properties when exposed to a wide range of temperatures.

Mechanical Strength and Dimensional Stability
Excellent strength, stiffness, long-term creep and fatigue properties.

Wear Resistance
High abrasion and cut through resistance combined with low coefficient of friction.

Chemical Resistance
Resistant to a wide range of chemicals at elevated temperatures in harsh environments.

Hydrolysis Resistance
Low moisture absorption, resistant to steam, water and brine, with low permeability.

Electrical Performance
Naturally flame retardant with electrical properties which are maintained over a wide frequency and temperature range.

Purity
Inherently pure with low particle generation and low outgassing for reduced contamination.

Recyclable
Fully recyclable providing environmental and regulatory benefits.

Ref: http://www.victrex.com/en/products/victrex-peek-polymers/properties/properties.php

The model is half the size that the actual outcome will be. The model shows the basic shape the car will be and allows me to get a deeper understanding into how I am going to build the car. Modelling the car also helps the stakeholder see if this outcome fulfils the issue.

Having researched a range of materials I have decided to use plastic for the main body as it is easily accessible, light, durable and comes in a range of colours. We have a plastics former at school so if this idea goes in to production I will need to make a mold to form the plastic."

Concept Development – Car mechanics
### Steering

There are two ways I can see to steer the remote control car. One way is to use servo's to change the direction of the wheel and the other way is to have one wheel move forward and the other on the opposite side move back.

A servo is a component that can rotate its star shape top when programmed to. I could make an axel which I would attach the servo to, which would then turn the wheels.

This way would be a bit trickier than the second way as it would involve a lot of moving parts. This would mean the car would require more maintenance and there for not meet the issue. Also the car would become harder to use as with the second method the car could spin on the spot, greatly increasing its manoeuvrability, whereas the servo method requires the car to move forward or backward to turn. I don't think this method suits the location.

The second method is very much like how a tank is steered. One side of the car moves forward and the other side moves back, this turns the tank on the spot. See right.
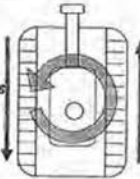
This method will require four motors, rather than the two that would be needed in the servo design. I think this is better though as I think the car will need the power of four motors instead of just two. This will also minimize the amount of fiddly moving parts I would have to construct making less amount of maintenance needed. This design will also be easier to control, as I explained before. This method of steering would fit the issue much better than the first method. For these reasons I shall use the motor method of steering instead of the servo method.

The student then identified other factors that would require further research: steering, motors, power and reverse relays. An example is shown of his research and evaluation of the steering needs, however the stakeholder was not involved in this decision making.

The student then provided evidence of his transmitter and receiver circuits and wiring diagrams and produced a working drawing of the toy.

The student produced working models of the car and the remote control device and was able to allow his stakeholder a 'hands on' experience of testing the model for fitness for purpose.

The student evaluated the potential of his conceptual model to meet the brief.

Working Drawing

(The I-shape of the chassis is two minimise weight, but still keep enough strength)
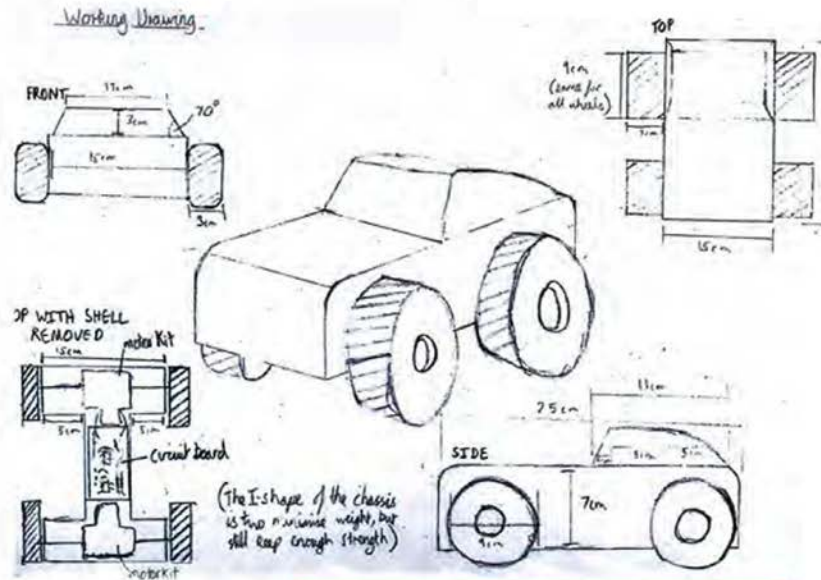
"I took my car model and remote to my grandfather's house and he was very pleased with it. None of the controls were labelled so it was a bit 'hit and miss' as to what he could get the car to do so I must think about labelling the controls. He also thought the car was a bit plain for my cousin as he did not understand that it was just a model and that is something I will develop when I manufacture the solution. We both thought the wheels could do with some traction on the rug.

I have met my brief by communicating my idea of a sturdy car that is remote controlled. The car can be steered around chair legs and other obstacles and will go forward and backwards. I tried the car on several indoor surfaces and it worked well (it was too wet to go outside). The transmitter circuit and 3v battery easily fits inside the controller."

	Grade Boundary: Low Merit
3.	For Merit, the student needs to develop a refined conceptual design for an outcome. This involves: • ongoing exploration and evaluation of design ideas to determine their suitability for inclusion in conceptual designs • using evidence from on-going research and functional modelling, including feedback from stakeholders, to evaluate conceptual designs. This student developed a conceptual design for a recipe card to be given out with a food parcel. The student explores and evaluates apple pinwheel scones to determine their suitability as a recipe to be included with a food parcel (1). The student researches different font types for inclusion on the recipe (2). A guest speaker from the Salvation Army identified that some clients did not know what to do with some of the ingredients in a food parcel, when they received them. Students were asked to develop recipes that were simple, culturally suitable, nutritious, easy to read, easy to cook, and enabled time saving. These factors were included in the research and development of the conceptual ideas. The student shows functional models of the recipe (3) and refers to the feedback from stakeholders in the evaluation of the conceptual designs (4). For a more secure Merit, the student could provide more detail of how the stakeholder assisted with the refinement of the conceptual outcome.

①

PLANNING and TESTING

Recipe: Apple Pinwheel Scones

Description of Recipe to be completed:
Swirled scones with chopped stew apples inside them.

INGREDIENTS EXPLAINED:

Cost of extras:

No extras were purchased

Nutrition:
Apples-vitamins
Bread-carbohydrates

Justify use in recipe set: no changes made

Justify Adaptations
No changes made, I just followed the recipe used.

Problems encountered and decisions or changes that need to be made:
The thickness and texture of the scone mixture made the scone dry. Maybe next time we could make the scone size thinner.

CODES OF PRACTICE

Planned Time: 1hour Actual Time: 50 minutes	Equipment	Safety	Hygiene	Techniques	Evaluation of my planning, competence and efficiency in this trial: overall the product was good. The taste though was very good and I will, in the future, make the product look more attractive.
Time management: it took shorter than expected as we were working together. To make it quicker I could prepare the apples in advance.	-knife -cutting board -peeler -Roller -Bowls -oven -oven mitts	-use oven mitts when taking thing out of oven -cut away from hands -point knife downwards.	-wash hands -use apron -roll up sleeves -clean all equipment used -take blazers off.	-peeling -cutting -baking -grating -slicing	

Recipe Trials - Planning for Production

②

Font Research

By reading the research on http://www.quintcareers.com/resume_fonts.html , I have found that fonts are a very important factor in any presentation, advertisements, resumes, etc... In this research they discovered what fonts will be suitable for various types of advertising and jobs.

"A few years ago, Pamela Henderson, Joan Liese, and Joseph Cote of Washington State University conducted research into how consumers react to various typefaces or fonts. Their purpose was to explore how marketers and advertisers can use fonts to convey specific messages and emotions in logos and advertising copy" Paragraph from "Research on Fonts and Marketing: Apply It to Your Resume?"

Fonts can trigger various emotions or feelings such as happiness, sadness, excitement, warmth, cold and much more. Although this research was mainly for resumes, advertisements, presentations I've decided to apply some information of the research onto the recipes that I will be making for my clients because through reading many recipes I have found some recipes that encourage and discourage me to keep reading. In this research they introduced some groups of fonts that can be found on most computers that trigger emotions and feelings.

Fonts		Emotions and feelings triggered
Shakespeare Balmoral Roman Ancient Script Lindra Pepita TNT	Lucida Handwriting Balai Sen Twill TT-Budha Bad Scyt 97	Warm and attractive
Baphomet Eagon Chiller Stonehenge Fairbanks	DESDEMONA Chalkboard	Exciting and inno...
Rigid Logan Box Industrial Inline StencilSet	Playbill SYNCHRO LET STENCIL Bonttensshweiler PortagoITCit	Cold and unem...
NewYorkDeco Baadsland SunSplash Middle Ages Fisherman	Braggadoccio Britanic Bold Gill Sans Ultra Bold Mistral 007 Script Capitals Wide Latin	Strong and ma...
AluminiumShred KaPaddy Integral Rarivon AmaZon		Interesting and...
Georgia Verdana Century Gothic Times New Roman Century Schoolbook		Standard comf...

The results of my research showed me that a majority of people given the opportunity to choose a font will choose simple fonts such as Georgia, Verdana, Century Gothic, Times New Roman, Calibri and Century Schoolbook which triggers comfort.

Also for the final recipe I have decided to use a standard recipe format consisting of Title, Ingredients, Methods, and pictures. But I have added a basic introduction to the food and a simple table for the ingredients needed.

③

Apple + Pinwheel Scones

Ingredients:
- 2 Cups Self Raising Flour   - 4 teaspoons b.powder
- 1 Tablespoons Butter
- 1 Cup Milk
- 1 Apple
- ¼ Cup Brown Sugar

Method:
1. Sift dry ingredients into a bowl and add sugar.
2. Rub butter until breadcrumbs and then add the milk.
3. Form a soft dough and then knead for 2 minutes.
4. Roll out dough and add the filling on one side.
5. Roll the scones to pinwheel shapes and place on tray.
6. Cover with milk and bake for 10 minutes.

Fluffy and light flavoured Apple Pin wheeled Scones. Enticed with a cinnamon flavour and rolled into a pinwheel and baked to your liking.

Calzone

Ingredients:
- 3 Cups of Water   - ¼ Cup Pizza Sauce
- 1 Teaspoon Dry Milk Powder   - ½ Onion
- 1/2 Tablespoons Active Dry Yeast
- ¼ Cups of Grated Cheese   - 500 grams Ham
- ¼ Cups of Water

Method:
1. Place dry ingredients and water together and mix together to rest for one night.
2. Roll out dough until 2cm thick then add cheese ham to the parcel shape.
3. Fold the dough over covering the filling.
4. Ceil the edges and brush egg yolk over the top of the calzone.
5. Bake for 25-35 minutes until golden brown.

A beautifully packed cheese, ham and spaghetti filling surrounded by a incredibly smooth bread dough and baked to your pleasure.

④

Fitness for Purpose

The recipes I have used throughout this project have been appropriate and fit for my purpose. My original brief was to "Develop some recipes that could be given out with a food parcel". I completed some background research, came up with ideas, trialled recipes using basic ingredients and looked at recipe formats and layouts. All this information and the feedback I received from my stakeholders helped me to come up with a range of recipes.

While developing my conceptual design I needed to consider:

- Lack of face to face contact with the clients — therefore I didn't know very much about them, ethnicity, cooking skills, food likes/dislikes, reading ability.
- Cooking / kitchen equipment available in the client's homes.
- Presentation / layout of the recipe.
- On-going use / reproduction of my recipes
- Costs of additional ingredients

My recipes are suitable and fit for the purpose of being given out with a food parcel because the ingredients used are simple, most of them found in a parcel and the extras are low cost. I have thought carefully about the layout and used the information given by the technologist from Menu Made when designing my layout. The recipes are easy to read; all formatted the same and are on a single page.

I have also thought about how they can be presented and decided the best way to reproduce my recipes (so they could be used more than once) was to either burn them onto a CD or laminate them and give a hard copy to the Salvation Army — they could then photocopy each recipe as they are needed.

	Grade Boundary: High Achieved
4.	For Achieved, the student needs to develop a conceptual design for an outcome. This involves: - establishing potential conceptual designs through generating and evaluating design ideas that are informed by research, including the analysis of existing outcomes - using evidence from research and functional modelling, including feedback from stakeholders, to evaluate conceptual designs - selecting and communicating the final conceptual design for an outcome - explaining the outcome's potential fitness for purpose. This student developed a conceptual design for an alarm system for the school auditorium. The student analyses existing alarms on the internet and compares decibel levels as well as research and analysis of electronic components (1). The student uses 2D and 3D freehand sketching to establish potential conceptual designs for a custom door alarm and develops a material/component list (2). A circuit is modelled and a 3D model of the receiver and transmitter housing and where it will be mounted is also modelled to gain stakeholder feedback (2). The student explains the outcome's fitness for purpose in an on-going way as the conceptual design develops(1) (2). To reach Merit, the student could show evidence of on-going exploration of design ideas, and stakeholder feedback would need to be more apparent throughout the practice.

①

Are you worried about your home being broken into!

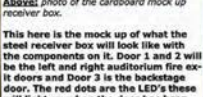Are you worried about some unidentified person entering through a door!

Well the solution is here with Gotcha Alarms. Many people have different shaped buildings that's why Gotcha alarms make custom door alarms for anyone. These alarms are made to your specifications and are able to withstand pretty much anything.

The main receiver is made of 0.5mm galvanised steel (strong enough to stand up to a car running over it). Being made of steel it is vandal proof. The top of it will be bolted to the main housing using dome head cap screws, these here are only able to be unscrewed with an allen key so it is a small added tamperproof accessory. All the components are selected to withstand tampering and hard knocks

Above: photo of the cardboard mock up receiver box.

This here is the mock up of what the steel receiver box will look like with the components on it. Door 1 and 2 will be the left and right auditorium fire exit doors and Door 3 is the backstage door. The red dots are the LED's these will light up when the door has been opened. The circle in the middle with the red *Continues top of next page*

and green LED's below it is the key switch which will switch the buzzer (big circle next to it) on or off. The buzzer will always be on but when a show is in session the buzzer will be switched off. When the key switch is engaged it will direct the current to the buzzer, which will go off *(along with the LED)* when the door is opened. This here alerts anyone on the ground that people are escaping from the back fire exit doors.

Above: photo of the mock up for the transmitter (shown in its environment)

This here is a cardboard mock-up of the transmitter photographed in its environment. The real transmitter will be made of aluminium or steel so it can stand up against the harsh knocks of people smashing it as it is within reach of people and it is also technically dobbing in the escapees from assemblies so must be vandal proof and tamperproof

Bottom of middle page : *photo of the steel receiver box.*

This is the steel receiver box with the top below. The corners of the box are welded. To the right of this text is the button head cap screws that will fix the main lid to the receiver housing. When properly wired up it will have a siren/buzzer inside the receiver which is able to be switched off (via key switch) when a show is on, switching off the buzzer will just allow the red LED's to light up so you can still tell that the door is open visually.

Above: photo of button head cap screws.

These button head cap screws will be used for fixing the front plate to the main receiver. As you can see they are only able to be undone with an Allen key so it prevents tampering of the internal components.

GOTCHA! ALARMS LTD

Evaluation

Summary of client feedback

- Costing: costing will be well under budget and has got the go ahead by the stakeholder and wider stakeholder.

- Material choice: the material choice is excellent as it sis galvanised steel that will stand up to knock, abrasions and vandalism

- Function: the function is excellent and will be able to work without fail

Further Research

The further research that I had to follow up on after meeting with my clientele was the frequency range, accuracy and frequency interference.

My clientele wanted to know was does the frequency that my final product transmits interfere with any other radio equipment in my environment and intended location.

In doing this I can program the door alarms to a frequency that will not interfere with the radios and the microphones.

Here is where the main receiver will be positioned, the reason it will be positioned here is because this is the main lock up door and is always the last to be locked at night making it easier on the caretaker.

" I met all my brief and specifications and my stakeholders are pleased. They feel there is a viable solution to alert the caretaker if the auditorium doors are left open. The alarm travels the expected distance to reach the main auditorium door. There are some minor technical issues as I had to modify the programming of the transmitters as the if they all transmitted to the receiver at the same time the picaxe chip is overloaded so I had to stagger the transmissions with 30 second delays.

The cost came under budget so I just need to make the final solution and spray the boxes black so they are not noticeable."

②

Concept Development

Batteries + power socket and PCB all fit inside

Aerial coming out of Receiver Box

Box is smaller

label plates with door number printed on it — Changed

Colour is still Black

Door 1
Door 2
Door 3

LED's to a chrome bezel LED (encased) Will not be tamperd with/ etc)

PCB fully its inside

Is sealed and tamper proof

Removed Key Switch

Removed Buzzer

May keep way as it is discrete that colour too

Smaller discrete box

Having established the container for the receiver and transmitter the student then provided evidence of his transmitter and receiver circuits and wiring diagrams.

It was in his 14 phase flow chart where the student showed evidence of testing the circuits.

The student then placed the receiver and transmitter in situ in order to test the alarm system and demonstrate potential fitness for purpose to the stakeholders.

My intended location will be positioned in four different areas.

Location	Type
1. The School Lighting Box	• Secondary receiver
2. Fire exit door 1	• Transceiver
3. Fire exit door 2	• Transceiver
4. And the main entry/lock up door	• Main receiver

Location 2: Fire Exit Door 1

Above is the left hand side door positioned behind the follow spot box.

This door will have a transmitter positioned in the top right hand side of the door frame.

Location 2: Fire Exit Door 1 Where the magnetic switch will be positioned (top right corner of door)

The transmitter will be positioned up in the very top right corner

②

Concept 1

Materials: The housing will be made of galvanised mild steel as this is to stop tampering and vandalism.

Construction: The construction of the housing will be made of galvanised steel (3mm) with welded edges this was chosen to withstand a harsh knock and/or sabotage.

Cost: The cost of the housing will be relatively cheap as the steel I will be using will be off cuts that have been put aside.

FOH RECEIVER

Key switch to silence speaker in production

DOOR 1
DOOR 2
DOOR 3

Finish: The finish of the concept will be the same colour as it's surroundings, but the finishing of the transceiver will be black in colour at where it will be positioned will be in darkness.

Speaker

Key Switch

Size: The size of the box will be 200mm long by 100 wide by 50mm deep these measurements should be big enough to fit the PCB in plus all the other components.

Red LED'S   Green LED   Speaker

Missile Switch Cover

LX RECEIVER

DOOR 1
DOOR 2
DOOR 3

Magnetic Reed Switch

Resources needed: The resources needed for this concept will need to be sourced from my father's work (DSK engineering)the school does not have a bending machine that can do 3mm plate steel so I will need to go into work with dad and bend up the housings on the break press at work.

Stakeholder feedback: _Cheap is good also durability is good._

EXIT

Shape: The shape of the manufactured products will be a rectangular prism

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Please note: The evidence presented in this exemplar provides snapshots of student evidence. The commentary aims to link the student evidence which for this standard was 40+ A4 pages.

The student brief was confirmed by the teacher:

"To develop a proposal for a conceptual design of an alarm system for the school auditorium"

Specifications included:

- Will alert by alarm
- Can transmit over 20 metres
- Run on 240VAC-12VDC power supply
- The transmitter will be battery powered.
- Low cost

Intended Location

This door (right hand side fire exit door) is hardly left open as you can see it from the stage, but it is also used to cool down the crowd in shows the only problem is that you forget about it and realise that you have to go back up the stairs to go and close it

As you can see from these photos if someone discovered that the fire exit doors have been left open on night someone could easily drive a car into the school grounds and onto the field behind the auditorium and start to load the car up with stolen equipment

The background to this brief is that the back doors to the school auditorium are often left open by mistake.

⬇

The student began his practice by investigating the environment and the places that need alarming.

⬇

He also developed a questionnaire in order to establish stakeholder view points on his identified issue.

⬇

He conducted minimal research into existing solutions and components with some annotation.

⬇

He produced a range of 2D and 3 D freehand sketching of his first design ideas and asked his stakeholders to fill in a concept screening chart.

How would you like to be notified when a person is escaping or entering the door?
- _Alarm light in administration area_
- _Flashing light in control room._
- _Light outside in entrance way._

How many receivers would you like throughout the school or auditorium?
2 - In Executive Office and Light Box

Would you like the doors alarmed (e.g. loud noise goes off when door is opened (noise can be switched off for productions)) or silent?
Yes - all doors to be alarmed and connected to light system as above.

Are there any other doors that are left open and that are a concern for the school?
- Administration area.

	Grade Boundary: Low Achieved
5.	For Achieved, the student needs to develop a conceptual design for an outcome. This involves: - establishing potential conceptual designs through generating and evaluating design ideas that are informed by research, including the analysis of existing outcomes - using evidence from research and functional modelling, including feedback from stakeholders, to evaluate conceptual designs - selecting and communicating the final conceptual design for an outcome - explaining the outcome's potential fitness for purpose. This student developed a conceptual design for a recipe card to be given out with a food parcel. The student produces a list of potential conceptual designs for recipe format which are evaluated and informed by research (1). (Analysis of existing outcomes was completed by the student but not shown in the exemplar.) The student talks about recipes that have been trialled throughout the project (functional modelling) and selects and communicates the final recipe and format (2). The student explains some of the outcome's fitness for purpose (3). For a more secure Achieved, the student could show more detail in the potential recipe designs. The final explanation for the choice of recipes and layout could show more depth. Further, the explanation could have also included verification from the client that it was an outcome that was potentially fit for purpose. The student would also need to overcome difficulties with feedback and communication with one of the key stakeholders.

①

How will I present my recipes?

Possibilities	Positives	Minuses
C.D.	Can add special effects	Not everyone has a computer
Booklet	Easy to read	Hard/expensive to produce
A4 sheets	Lots of space	Possibly to big and in the way
A5 sheets	Nice and small and neat	Possibly not enough room for recipe
Laminated A4 sheets	Lots of room, spill and tear proof	Could be to big

What so I need to include in my recipes

Essential features	Why are they important	How will I do it?
Title	So the client doesn't spend ages looking for what the recipe creates	I will put a clear colourful title that is easy to read
Ingredients	Without these the recipe cannot be made.	I will clearly list the ingredients in a font that is easy and clear to read.
Serving size	This is important because the person using the recipe needs to know how much the recipe serves.	On each of my recipes I will clearly state how much he recipe servers at the bottom of the page
Method	This is what makes the recipe easy or not to read and follow	I will use a clear font and basic language in order for the method to be easy to understand and follow

Presenting My Final Design
In order to complete my project I needed to think about how I would present my final idea to the client. I wrote up the positive and minus points of 5 different ways I could give copies of my recipes to the Salvation Army. I also listed the things that needed to be in each recipe layout and explained why this was important.

I decided the best way to reproduce my recipes (so they could be used more than once) was to either burn them onto a CD or laminate them and give a hard copy to the client – they could then photocopy them as they are needed.

(2)

Stuffed Potato

4 medium baking potatoes   ¼ cup butter (cubed)
1 cup shredded cheddar cheese   4 cooked bacon strips
3-4 green onions, sliced

Method

1. Bake potatoes at 400° for 1 hour or until tender. Cool slightly. Reduce heat to 350°.

2. Cut each potato in half lengthwise. Scoop out pulp, leaving a thin shell. In a large bowl, mash the pulp with butter. Stir in the sour cream, cheese, bacon and onions. Spoon or pipe into potato shells.

3. Place on a baking sheet. Bake for 30-35 minutes or until heated through.

Serves 8

I have had real problems with my client and their lack of response to emails. I have sent them ideas and recipes to trial but most of the time they have not replied. My classmates, teachers and family have tried my recipes and looked at the layout I have come up with. My family like the layout with the picture at the top because it is clear, simple and very easy to read. I also had feedback from other teachers at school. The best advice is to make sure all the recipes have a photo and follow the same format.

(3)

I used recipes from magazines, recipe books and the internet to design what I think is a suitable, straight forward recipe. I found it easy to read with clear instructions on how to complete the recipe correctly as well as a photo of what the final product should look like. The recipe also flows in chronological order which makes it ideal to use.

The recipes I have used throughout this project have been appropriate and fit for my purpose. The recipes are basic and fit for a food parcel because the ingredients used are simple and relatively cheap. I believe that if someone was to receive a food parcel with some of the recipes I have given them, they will be able to read my basic easy to read layout and also be able to afford any extra ingredients required. My main stakeholder (Salvation Army) has not been helpful with the feedback I require. Numerous emails have been sent requesting feedback to help with my recipes.

	Grade Boundary: High Not Achieved
6.	For Achieved, the student needs to develop a conceptual design for an outcome. This involves: - establishing potential conceptual designs through generating and evaluating design ideas that are informed by research, including the analysis of existing outcomes - using evidence from research and functional modelling, including feedback from stakeholders, to evaluate conceptual designs - selecting and communicating the final conceptual design for an outcome - explaining the outcome's potential fitness for purpose. This student developed a conceptual design for a remote contolled lamp for his mother. The student evaluates three lamp concepts in terms of physical attributes (one is shown here) (1). The student uses a 3D cardboard model to test for shape and size in the location (2) and produces a functional model to test circuitry. There is evidence of stakeholder comments (3). The student presented the conceptual design to the stakeholder. To reach Achieved, the student could show more evidence around establishing potential conceptual designs through generating and evaluating design ideas that are informed by research, including analysis of existing outcomes. The student would also need to further evaluate conceptual designs and they would also need to communicate a final conceptual design which showed development that went beyond shape. The evaluation would need to explain potential fitness for purpose in terms of more than just appearance (4).

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Please note: The evidence presented in this exemplar provides snapshots of student evidence. The commentary aims to link the student evidence which for this standard was 40+ A4 pages.

The student brief was confirmed by the teacher:

"To develop a conceptual design for a remote controlled lamp for his mother to use by her bedside"

Specifications included:

- Easy to use
- Low maintenance
- Has a flat bottom so that it sits steadily
- Holds a 60 watt bulb
- Needs to fit on the bedside table.

An issue of lighting was established and the need to have it remote controlled for ease of use particularly at night.

⇩

The student began his practice looking at a range of lamps and evaluating them on their physical attributes. There is no evidence that actual existing lamps were investigated or the recommended wattage for lighting in a bedroom.

⇩

He started by producing three 2D design ideas for lamps and considered the physical attributes with some consideration of the function and asking for stakeholder comment.

Concept 3

—The rounded base of the speaker will have a flat bottom so that it may sit firmly on the bedside lamp (on the intended location)

—Circuits will be placed inside the spherical base of the lamp where it will be safe and secure if knocked over or in case of an accident.

—colours will need to be to the liking of the key stakeholder.
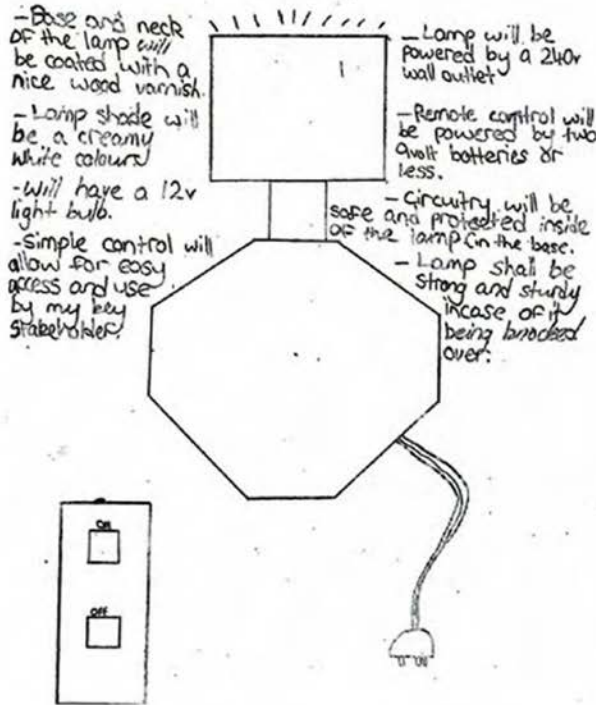
—Lamp will be plugged into a wall power outlet.

—This simple design would be easy to manufacture in the time that we are given.

—Base would be manufactured from plastics that have been moulded into a sphere.

Stakeholder Comments:
The lamp appealed to my key stakeholder as it looks as though it will be strong and sturdy, and will keep all circuitry safe from all damage done from being dropped or kicked over.

③ *Concept Development*

- Base and neck of the lamp will be coated with a nice wood varnish.
- Lamp shade will be a creamy white colours.
- Will have a 12v light bulb.
- Simple control will allow for easy access and use by my key stakeholder.

- Lamp will be powered by a 240v wall outlet.
- Remote control will be powered by two 9volt batteries or less.
- Circuitry will be safe and protected inside of the lamp in the base.
- Lamp shall be strong and sturdy incase of it being knocked over.

On

Off

The student continued to develop his design through 2D drawing. The ideas remain untested.

⬇

The student then researched materials that could be used but the research needed to be applied to the brief for the lamp and some consideration of the location needed to be shown.

Research

Materials – Woods:

Teak: Ranging in colour from dark brown to yellowish-brown, it has mineral streaks that give it a contrasting grainy structure. The texture of teak is oily, and it is a strong and durable wood, which is resistant to warping and insects. This is a popular wood for making various types of furniture pieces.

Cherry: The colour of this wood ranges from reddish-brown to light pinkish. It is a close grained wood with markings like gum pockets and pitch pockets. The figure in this wood varies from highly mottled to plain. When polished, it can become glowing and deep red. It is used to make all types of furniture from chairs to cabinets.

Maple: This wood ranges from cream-white to snowy-white, although during the off season you do get a few that are yellowish in tone. It has mineral streaks and sugary specks, and also sometimes contains figures that are quilted, blistered, fiddle back, or curly. One of the hardest woods is hard rock maple. When hand-rubbed with oil it can be given a golden-ivory warm colour.

Transmitter Circuit:

②

Reciever Circuit:

②

The student then produced a 3D cardboard model of the lamp to gain stakeholder feedback.

⬇

The student then provided evidence of his transmitter and receiver circuits and wiring diagrams. There was no evidence of testing.

⬇

The student evaluated the potential of his conceptual model to be potentially fit for purpose.

Modelling Evaluation

③

Quotes From My Key Stakeholder:

❖ *I like the design of the lamp and the remote control, as it is simple and will be able to be manufactured in the time frame given.*
❖ *The remote controls design appealed to me as it fits easily in the palm of my hand and will be easy to use.*
❖ *I would like the lamp to use a 60v bulb instead of anything like a 240v bulb, as it would be easier on the eyes and would cost less to run.*

Summary Of Evaluation:

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I have presented the model to my key stakeholder and I have then placed the model in the intended location on the bedside table. My key stakeholder, my wider stakeholder and myself have all decided and agreed that the square lamp shade looked more appealing than the small undersized triangular lamp shade which was, at first going to be used. My stakeholders have both agreed that they like the rectangular remote control that was designed, as it is easy and straight forward to use. We have all also agreed that the lamp would look most effective when coated with a wood