Food Technology

Year 11 Curriculum Level: 6

Course Title: Food Technology

Course Duration: 1 year (4x60 minute periods per week). The course will consist of two units.

Course Description: Students are provided with an opportunity to learn about local produce and adding value to primary foods. They will learn how to design and develop food products to meet specific consumer needs. To do this they will develop knowledge of and skills in a range of food, carry out experimentation and modelling when generating and selecting ideas, and develop their own design ideas into 'fit for purpose' food technological outcomes.

Unit 1: *Flavours of the Bay of Plenty*

Component/Learning Objectives:

- **Knowledge of product preservation, packaging and storage:** students will demonstrate understandings of basic concepts and techniques used in the preservation, packaging and storage of products.
- **Implement a process**: students will implement basic procedures to make a processed product.

Unit Duration: 12 weeks

Unit Description:

This unit provides students with the opportunity to learn about local produce and adding value to primary foods. They will learn a range of processing techniques that can be used to preserve fresh produce for use in the local environment. Students will gain an understanding of how to control food spoilage and maintain the integrity of a product over time. They will then produce their own preserved product for a specified purpose.

Context:

The Bay of Plenty was named for its plentiful 'fruit bowl' properties and its fertile soils and warm climate are ideal for growing just about any type of produce, especially the iconic kiwifruit. Although the region is renowned for growing kiwifruit, other produce such as avocados, grapes, citrus and subtropical fruits are also plentiful.

Issue:

With so much fresh produce in our backyard, it's easy to enjoy locally grown fruits and vegetables. Preserving the abundant produce allows it to be enjoyed in a range of ways throughout the year.

Learning Outcomes:

Students will:

- Demonstrate understanding of techniques used to preserve, package, and store local produce, by explaining:
    - the types of decay that typically occur
    - the links between different types of decay and different types of preservation, packaging, and storage methods

- the legal requirements for labelling the specified product

- Follow a step by step plan to use processing operations and tests to produce a food product to an agreed set of specifications

Unit Overview:

Exploring the context

Research the issue by investigating different types of fresh local produce and existing products that utilise food from the Bay of Plenty region. ***(Use actual examples and images)***

Determine and discuss:

- how and why the produce has been processed
- the environment it is to be placed in
- its intended use
- seasonality
- packaging and storage conditions

Food preservation

- Microorganisms and why we preserve food
- Controlling food spoilage (in the past, today and in the future)
- Types of food preservation (e.g. bottling, sauce making, dehydrating, curd making)
- Effective techniques (e.g. preservation and packaging methods that prevent various kinds of deterioration and decay)
- Storage conditions used (e.g. ambient, chilled, frozen)
- Labelling requirements and their application in local environment

Basic procedures to process a range of produce for different purposes

- Introduction - including routines, safe work practice and equipment use
- Trial a range of processing operations to produce different preserved products
- Provide students with examples of sequences/plans (e.g. flow diagram) for each trial
- Explore testing techniques (e.g. temperature, enzymatic browning, moisture, air, pH, colour, viscosity)
- Record relevant test results for each trial on plan provided

Produce a preserved product

- Select the product for students to produce (alternatively a choice may be provided)
- Determine the specifications that product will be assessed against.
- Students create a plan showing the steps they will follow and the test/s that will be carried out.
- Produce the product, record tests carried out. Photograph and annotate the process.

Assessment:

- **AS91084 (1.62)** suggested format: portfolio, power point, display board, written report
- **AS91082 (1.60)** completed preserve, annotated plan and evidence of testing undertaken.

Links to assessment resources:

Refer to http://www.tki.org.nz/e/community/ncea/tech-lvl1.php for published assessment resources 1.60 and 1.62 Food.

Unit 2: *Meal in a Moment*

Compoent/Achievement Objectives:

- **Brief Development** - students will justify the nature of an intended outcome in relation to the need or opportunity and justify specifications in terms of key stakeholder feedback and wider community considerations
- **Outcome Development and Evaluation (Conceptual design)** - students will critically analyse their own and others' outcomes to inform the development of ideas for feasible conceptual design. Undertake ongoing experimentation and functional modelling, taking account of stakeholder feedback and the intended physical and social environment. Use the information gained to select, justify, and develop a final conceptual design. Evaluate this outcome's fitness for purpose against the brief and justify the evaluation using feedback
- **Technological Modelling** – students will understand the role and nature of evidence and reasoning when managing risk through technological modelling

Unit Duration: 20 weeks

Unit Description:

This unit provides students with the opportunity to learn about the development of food products designed to meet specific consumer needs. They will investigate a range of existing meal kits to identify a need or opportunity. Students will carry out experimentation and modelling as they generate and select ideas to develop their own conceptual design for a meal kit that will be based on a favourite family meal. Stakeholders, the intended social and physical environment and available resources will be considered throughout the development. The final conceptual design will be justified in terms of feasibility and fitness for purpose for the brief.

Context:

Meal kits provide consumers with the opportunity to produce a variety of meals in a moment. A meal kit can be defined as: shelf – stable food items intended to be used for a main meal, typically consisting of meat, starch and sauce. Meal kits require users to combine and sometimes add outside ingredients. They save consumers time by combining the ingredients required to make a meal in a convenient package. Simple instructions mean that novice cooks can make a tasty meal that will be enjoyed by the whole family.

Issue:

Consumers need for convenient, fast and easy meal solutions have continued to drive the recent development of meal kits. Ideas come from many places but are initiated by a need or opportunity in the market. Evening meals in the home can be prepared quickly and easily when one of the main components is a meal kit. However, the choice of meal kits currently available on the market may not always reflect the kind of meals enjoyed by your family.

Learning Outcomes:

Students will:

- identify a need or opportunity from the given context to establish a conceptual statement and specifications for a meal kit
- generate design ideas that are informed by research and use stakeholder feedback to support and justify key design decisions
- develop sketches and use modelling tools that effectively communicate and test their design ideas as they develop their conceptual meal kit design
- evaluate the conceptual meal kit design against the specifications to determine the proposed outcome's potential fitness for purpose

- describe practical and functional reasoning and explain the role of technological modelling to illustrate how prototyping provides information to determine maintenance requirements to ensure minimal risk and optimal performance over time

Unit Overview:

Exploring the context

Research the issue by investigating the role of convenience food products in today's society, specifically types of existing meal kits available on the current market. (Use actual examples and images). Determine and discuss:

- how and why the products have been processed
- the environment it is to be placed in
- its intended use
- the target market
- packaging, preparation instructions and storage conditions

Explore and discuss:

- current food trends
- changes and influences in New Zealander's meal choices
- traditional family favourite meals
- initial physical and functional attributes that would be desirable in a meal kit product (e.g. easy to follow instructions, nutritional value, appealing appearance, skill of the user, availability of equipment, final meal quality and acceptability)

Idea Generation

Explore initial design ideas by:

- brainstorming a variety of potential ideas and situations to identify a need or opportunity that would address the issue
- choosing a family favourite meal and key stakeholder/s you would like to develop a meal kit for
- write an initial conceptual statement and initial specifications for the meal kit to be developed
- researching potential favourite recipes that may be useful for development

Brief development

Research the social and physical environment where the meal kit is likely to be used and the resources that may be needed for its development. This could include further:

- Consumer research: what the target market group would want from such a product
- Market research: what similar products may already be available, how they are priced and positioned, what ingredients they contain and what processing methods have been used
- Technical research: trial different materials and techniques to test initial ideas (e.g. suitability of chosen ingredients, flavour, reliability, suitability for target market and/or key stakeholder/s, final meal quality and acceptability - resemblance to homemade product made from scratch, time needed – does it save time?)
- refine conceptual statement and specifications as appropriate

Technological modelling

Explore the types and importance of functional modelling and prototyping used in the food industry and how information can be gathered from these to inform decision making regarding technical feasibility and social acceptability) to identify types of modelling used and how these informed the designs development.

The following case studies on Techlink may be useful:
http://www.techlink.org.nz/Case-studies/Technological-practice/food-and-biological/index.htm

- New Product Development at Heinz Wattie's
- Developing a new stir-fry sauce
- A Bit on the Side

Developing design ideas
Using 2D sketching or 3D modelling to:

- analyse data (stakeholder feedback)
- research alternatives to inform selection of design ideas
- annotate sketches to show both physical and functional design features of their meal kit ideas
- trial and model techniques to test design ideas with stakeholders
- make any refinement to the meal kit's design and justify why these may contribute to the potential outcome's fitness for purpose

Finalising the brief and conceptual design
Presentation of:

- write a final developed brief comprising of a conceptual statement and specifications
- communicate the final meal kit conceptual design to show design features which could include such things as: other components that would be included, packaging and labeling, instructions for use
- evaluate the conceptual design against the specifications of the brief and final stakeholder feedback to determine and justify the proposed outcome's fitness for purpose

Assessment

- **AS91044 (1.1)** Undertake brief development to address a need or opportunity – 4 credits: internal
- **AS91046 (1.3)** Use design ideas to produce a conceptual design for an outcome to address a brief: 6 credits: internal
  Suggested format: portfolio, completed conceptual design and evidence of practice undertaken.
- **AS 91048 (1.5)** Demonstrate understanding of how technological modelling supports decision making – 4 credits: External
  Suggested format: written report

Links to assessment resources:

Refer to http://www.tki.org.nz/e/community/ncea/tech-lvl1.php for published assessment resources 1.1 and 1.3.
Refer to http://www.nzqa.govt.nz/qualifications-standards/qualifications/ncea/subjects/technology/sample-external-assessments/ for sample assessment guides for 1.5