

Lesson Overview

In this module students will explore the nutritional value of eggs in a range of preparation styles, and how these styles impact on a specific demographic's nutritional needs (such as: children under five, people aged over sixty, teachers, etc). Students will explore empathy techniques in an attempt to understand their audience and design a product to solve a real-life problem.

An inquiry-based approach will be implemented to deliver this unit, incorporating a range of cooking and design techniques for students to explore. These will be used to present their product to an audience at the culmination of the process. Students will use the Design Thinking learning model proposed by the Hasso-Plattner Institute of Design at Stanford (2011) which will guide their work through five interconnecting phases: Empathise, Define, Ideate, Prototype and Test.

Lesson Intentions

Students will understand:

- The nutritional value of eggs
- How to empathise with a chosen focus group
- The considerations of different groups of consumers
- A range of different egg preparation techniques
- A range of different food presentation techniques
- The Design Thinking model and its use in Design and Digital Technology

Teachers Notes

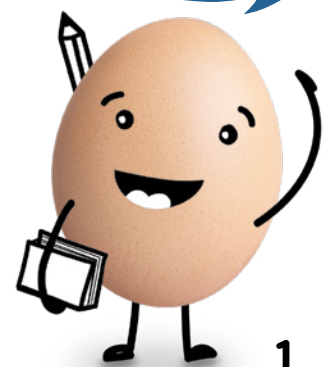
Resources and Materials

- Australian Eggs website: www.australianeggs.org.au/
- Supplementary interactive whiteboard resources
- Electronic devices for research, such as laptops or iPads
- Activity sheets (printed, enlarged to A3) <https://www.australianeggs.org.au/education/secondary/nutrition-is-no-yolk/>
- Sticky notes
- Felt tip pens, other writing mediums
- Access to cooking equipment, e.g. stove tops, saucepans, ovens, knives, etc.
- Eggs, supplied by school
- Various ingredients - supplied by students
- Various equipment for design use, e.g. cardboard, rulers, craft knife, scissors, paints, bubble wrap
- Egg cartons for different types of eggs including: cage, barn-laid and free range

This unit is supported by interactive whiteboard resources available at:

<https://www.australianeggs.org.au/education/secondary/nutrition-is-no-yolk/>. For schools who do not have an interactive whiteboard or have limited access to an interactive whiteboard; please note that the resources can be downloaded as a pdf document, printed or accessed with shared or student-owned electronic devices. They can also be used simply as teacher inspiration if you wish to create your own resources to support this unit of work.

Follow me,
let me
Eggspain!



Teachers Notes

Differentiation

As with all of our lesson plans, we encourage teachers to differentiate the activities by making any necessary modifications in order to cater for diverse student learning needs.

Note: the suggested duration of the activities found within this module may require adjustment to cater for the needs of your students.

Assessments

There are a number of informal assessment opportunities throughout this lesson including:

- Class discussion
- Student questioning
- Student workbooks (activity sheets)
- Observation
- Peer feedback
- A summative assessment of the finished digital resource

Stage 4 Curriculum links

Digital Technologies

ACTDIP027 Define and decompose real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints

ACTDIP031 Evaluate how student solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability

ACTDEK033 Analyse how characteristics and properties of food determine preparation techniques and presentation when designing solutions for healthy eating

ACTDEP037 Select and justify choices of materials, components, tools, equipment and techniques to effectively and safely make designed solutions

Humanities (Geography)

- **ACHGK045** The influence of environmental quality on the liveability of places
- **ACHGK047** Strategies used to enhance the liveability of places, especially for young people, including examples from Australia and Europe
- **ACHGK051** Human causes and effects of landscape degradation
- **ACHGK059** Management and planning of Australia's urban future

Health and Physical Education

ACPPS073 Investigate and select strategies to promote health, safety and wellbeing

ACPPS076 Evaluate health information and communicate their own and others' health concerns

Cross curriculum priorities

- Sustainability

General capabilities

- Literacy
- Numeracy
- Critical and Creative Thinking
- Personal and Social Capability
- Ethical Understanding



Stage 1: EMPATHISE

Activity 1

1. Explain to the students that in this series of lessons they will be solving a real-life problem using the Design Thinking Model and their own knowledge and research.
2. Display the following **Design Thinking graphic** on the interactive whiteboard (IWB), and explain that Design Thinking is a human-centred approach to problem solving which focuses on creative, practical solutions to meet user needs.
3. Explain to students that in this unit they will have a real-life task on which to practise and apply their Design Thinking skills. Display the following task on the IWB:



“Can eggs be used to improve the nutrition and overall health of certain groups of people in society?”

- In groups, design and develop a food product for a chosen social group, (for example, children under five, people aged over sixty, people with specific health challenges, etc) which addresses their individual needs and concerns. The product must contain eggs and be deliverable over distance and time. The finished product must display:
 - An understanding of the nutritional value of eggs
 - An understanding of their chosen group’s needs
 - An understanding of different preparation techniques

Each group must also create a reflection document containing information on their decisions and an evaluation of their product against a class-designed success criteria.

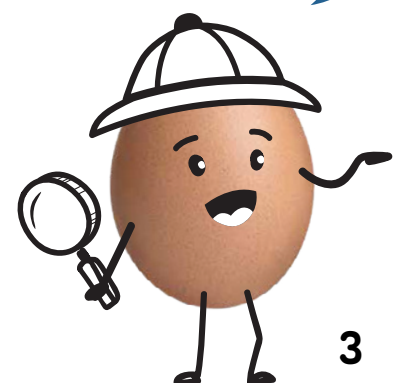
4. As a class, collect students’ thoughts on what a ‘healthy diet’ means to them. Record key words and phrases.
5. Using the supplementary teacher guide and resources, display the **Australian Guide to Healthy Eating** on the IWB. Discuss the division between each section, i.e. different percentage of carbohydrates vs fats. Talk about the recommended daily intakes for an adult versus a child.
6. Talk about where eggs fit into a healthy diet. Discuss the nutritional value of eggs and how they contribute to a healthy diet and body. A full nutritional profile of eggs can be found on the Australian Eggs website at the following link: <https://www.australianeggs.org.au/nutrition/>.
7. Discuss how a ‘healthy diet’ may differ for various age groups. For example: young children, teenagers, adults and mature people 50+.
8. Ask for students’ ideas and brainstorm a list of any other social groups who encounter barriers to their nutritional intake.

Activity 2

1. Split class into groups of three or four. These will be their work groups for the entirety of the project.
2. Explain that when solving a problem using the Design Thinking method, it is important to understand who the problem affects, so we can design a solution to meet their needs. This is called the Empathise stage of Design Thinking.
3. In their groups, students must pick a social group on which to focus. Hand out the **Empathise 1: Chosen Audience Empathy Map Activity Sheet** to each group and encourage groups to explore their knowledge of this social group, detailing their needs, factors impacting their nutritional experience and their daily experiences in an attempt to fully understand and identify with them.
4. Hand out the **Empathise 2: Chosen Audience Justification Activity Sheet** individually. Students can now use their empathy maps and knowledge of their chosen group to answer the question: Why did you choose this social group and how do you think your product will improve their nutritional experience?

Teacher tip:
Point 3 - This works best if students pick a group they have access to and can interview later in this stage!

Encourage groups to explore the following page on the Australian Eggs website which hosts a range of information about eggs and various groups of people with extra nutritional needs:
<https://www.australianeggs.org.au/what-we-do/healthcare-professionals/>



Stage 1: EMPATHISE

Activity 3

1. Gather students' ideas around why it might be important to further empathise with our target audience. How can we do this? Direct students towards the use of face-to-face research tools, such as surveys and interviews. Display the following graphic on the IWB and discuss the difference between surveys and interviews, evaluating in terms of usefulness for the task above.
2. Explain that to fully understand someone's experiences and attitudes, it is often better to ask them directly.
3. Hand out the **Quick Quiz Activity Sheet** to each student and give the students time to fill in their answers to the questions.
4. Collect the sheets and shuffle them, then re-distribute them so each student receives a different quiz.
5. Ask students to read over their peer's answers and volunteer one thing that they have learnt about that person.
6. Student groups will now design a quiz or survey to give their chosen audience to learn more about their nutritional habits and daily experiences.

Questionnaire (Realist, Positivist, Quantitative?)	VS	Interviews (Realist, Interpretivist, Quantitative?)
Larger data sets		Smaller data sets
Frequencies		Meaning
Statistical info		Language
Measuring response		Lived experience
Closed/Open Q's		Open Q's
Knowing		Understanding
Cost		Cost

Teacher tip:

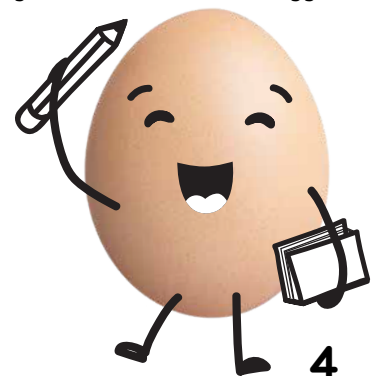
Surveys should aim to be short, with some opportunities for full sentence answers and some opportunities for easily measurable attitudes based on the Likert scale (found here: <https://www.surveymonkey.com/mp/likert-scale/>). This should increase participant engagement and give students a wider sample of consumers. Surveys must be approved by a teacher before being distributed to participants.

When critiquing each groups' work keep language positive and focussed on the task.

7. Plenary. Bring the class back together and give each group an opportunity to share their survey or interview questions with the class. Critique the surveys or interview questions together and encourage groups to make any necessary changes to their survey or interview questions based on the feedback.

Activity 4

1. Show students the packaging from different types of eggs, i.e. cage, barn-laid and free range. Collect students' ideas of the differences between them.
2. Open a discussion about the different packages and the feelings evoked by the different visuals. Look at the language used on each box and think about what these might mean to different buyers.
3. Display each egg production system on the IWB and invite a discussion about each photo and how each system might affect the welfare of the hens and the quality of the eggs.
4. Hand out the **Egg Box Comparison Activity Sheet** to each group for students to complete, paying attention to the features of each box and their knowledge of each production system. Invite students to study and compare the nutritional information panel on each box. Are they the same? Is there anything that is different? Why do you think this is? What does this mean for our project?
5. Plenary. Bring the class back together and give groups the opportunity to share new or interesting information about the egg cartons and/or production systems.



Stage 2: DEFINE

Activity 1

1. Explain that in the Define stage of Design Thinking we will attempt to understand the task more fully by exploring each aspect in detail, starting with the egg.
2. Gather students' ideas about eggs including: previous knowledge, how they can be used, and their nutritional value. Note down key words.
3. Have students visit the Australian Eggs Nutrition page on an appropriate electronic research device, such as a laptop or iPad, to explore the nutritional value of eggs in detail. <https://www.australianeggs.org.au/nutrition/>
4. Give out the **Eggs for Everyone Activity Sheet** and encourage students to write a brief paragraph explaining why an increased intake of eggs will have a positive impact on their target groups' lifestyle.

Activity 2

1. Open a discussion about food health and safety. What do students know about food preparation in the home versus in a cafe or restaurant? What are the legal requirements? What do people need to be careful of? Record key words.
2. Display a picture of a meal on the IWB. Ask students to think about the food health and safety procedures that have gone into creating this meal at home, for example: choosing and storing the ingredients, basic health and hygiene, skills and knowledge of person who prepared the meal, the environment it was prepared in, how it was prepared, etc.
3. Give out the **Food Health and Safety Activity Sheet** and ask students to fill in the table by comparing practice for food preparation at home versus food sold in a business. Students may require access to the internet on an electronic device, such as a laptop or iPad, to explore the legal requirements of food safety in Australia.
4. Plenary. Bring the class together and give each group the opportunity to share their Food Health and Safety notes and anything new or surprising.

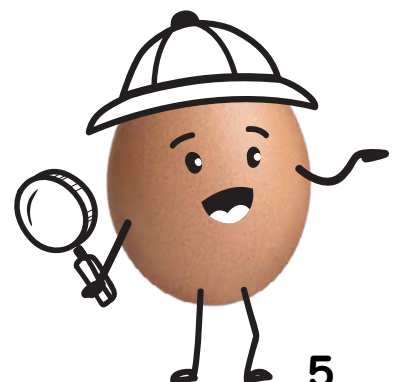
Activity 3

Warning: In this section students will be using cooking equipment such as ovens, hot pans, knives and boiling water. Please ensure you have adequate supervision and have briefed students on food health and safety. Please ensure there is a fully stocked First Aid kit easily accessible.

1. Gather students' ideas about how eggs can be cooked. Record on the IWB.
2. Show class the egg preparation image and talk about each picture.
3. Demonstrate how to prepare a baked egg. When the egg is cooked, talk about how this recipe can be modified to create different dishes, e.g. egg muffins, shakshuka, frittata, etc.
4. Give students the opportunity to bake an egg in their groups.
5. Discuss how each groups' egg turned out and talk about any that did not turn out as planned, e.g. no fat used in container, oven temperature not high enough. Students may wish to make notes about the process and record any tips that are highlighted throughout the process.
6. Repeat steps 2 to 5 for fried eggs, scrambled eggs, poached eggs and hard and soft boiled eggs.
7. Plenary. Bring the class together to evaluate each preparation technique in terms of how easy it was to execute.

Activity 4

1. With knowledge of basic preparation techniques for eggs, students now have the opportunity to research different egg recipes and use this research to develop a new recipe, product or cooking method for their target group.
2. Groups use the internet and/or a selection of cookbooks or magazines to research and collect five recipes which use eggs prominently. Students are encouraged to choose recipes for a variety of different meals, e.g. breakfast, lunch, dinner, snack etc.
3. Hand out the **Recipe Research Activity Sheet (A3)** to each group for students to record their recipes.
4. Plenary. Bring the class together and ask each group to share their favourite recipes to create a class list.



Stage 3: IDEATE

Activity 1

1. Explain to groups that the Ideate stage is the creation and production part of Design Thinking. Each group will be expected to plan out and produce a full egg-based meal for their chosen focus group using their knowledge of the focus group's needs, knowledge of egg preparation techniques and knowledge of food health and safety.
2. Revisit empathy maps of their chosen focus groups and use these to evaluate the usefulness and relevance of each recipe they researched in the Define stage. Students should comment on the time each recipe needs to prepare, the amount and type of equipment needed, the cost of the ingredients, number of servings each recipe yields, how each recipe could be transported to the consumer and the overall nutritional value of the meal. Discuss each of these using the example recipe provided.
3. Hand out the **Recipe Research Evaluation Activity Sheet (A3)** for students to record their thoughts for each recipe.
4. Plenary. Ask each group to explain the recipes that were least and most suitable for their focus group and why.

Activity 2

1. Display the picture of a toddler on the IWB and discuss the descriptors around him. Add more if necessary to describe the needs, abilities and habits of a toddler.
2. Display the next slide **A successful meal would need/be** and discuss how the descriptors have informed the criteria for success. Add any more relevant criteria generated by student ideas.
3. Revisit the empathy maps each group created in the Empathise stage and encourage groups to create a list of criteria against which they will assess their final product on the **Creating a Success Criteria Activity Sheet**.
4. Plenary. Groups to swap their success criteria with another group for a peer assessment. Necessary changes should be made based on the feedback received.

Activity 3

1. Groups are now ready to begin designing their prototype. Using their success criteria, empathy map and knowledge of egg-based recipes groups should work together to design an egg-based meal for their focus group.
2. Hand out the **Meal Planner Activity Sheet**. Groups should draw a picture of their completed meal, list the ingredients and equipment they will need, and write out steps for the method. Students will be working out the exact nutritional value of their meal so each group needs to be accurate when recording the amount of each ingredient used. Students can research online using sites such as www.nutritionix.com to find nutritional values for their ingredients and add these up to find the total calorie count for their meal.
3. Each group's plan must be approved by a teacher before groups can begin preparing their meal prototype.

Teacher tip:
Ensure students have adequate time for this. Students may need assistance with using equipment or presenting their ingredients. Ensure students are following the food health and safety procedures set out by the school.

Stage 4: PROTOTYPE

Activity 1

Warning: In this section students will be using cooking equipment such as ovens, hot pans, knives and boiling water. Please ensure you have adequate supervision and have briefed students on food health and safety. Please ensure there is a fully stocked First Aid kit easily accessible.

1. Explain that in the Prototype stage of Design Thinking groups have the opportunity to create their vision as a whole product and evaluate how well it meets the needs of their focus group. Explain this is a good time to make mistakes and change parts of their product to better fit the success criteria, as the prototype stage is used to see what works and what needs to be modified.
2. Groups gather their ingredients and equipment, then create their meal.
3. Groups take a photo of their finished meal.
4. Publish each group's photo and hashtag **#AustralianEggs** or tag **@australianeggs** to show off their finished meals on the Australian Eggs Instagram page! (Ensure any photos show only the created meal and no students.)

Extension Activity

1. Students design and create a prototype packaging option for their product. It should be waterproof and airtight to increase shelf life. The design should have nutritional information about the product as well as an appealing look and feel. Packaging should be aimed toward the focus group's needs.

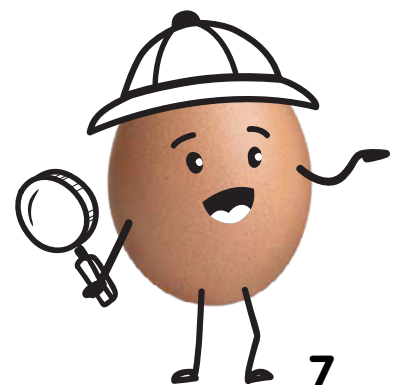
Stage 5: TEST

Activity 1

1. Using their success criteria, groups should evaluate their prototype. Does it fit the needs of their focus group? Do eggs feature as the prominent ingredient? What needs to be modified?
2. Groups now design a survey, based on the information in their empathy maps and the success criteria to present to the focus group with the photo of their prototype (students may also share their actual prototype dish with the focus group if appropriate, e.g. if they can recreate it at home).
3. Present the prototype product to members of the focus group with the survey and record reactions/answers on the **Participant Feedback Activity Sheet**, depending on the age of the participants.
4. Plenary. Open a discussion about the importance of feedback from your consumer. How will this help us? What will be our next steps?

Activity 2

1. Record any necessary changes to the product that will need to be made based on the feedback received on the **Participant Feedback Activity Sheet**.
2. Individually, students write an evaluation paragraph about their Design Thinking experience. They should include a brief overview of the task, an explanation of their chosen focus group, reasons for choices they made throughout the process of designing their product, how the product was received by the focus group, any changes that were made and the reasons for them and how well the product met their success criteria.
3. Plenary. Bring the class back together and give each group an opportunity to present their product and explain any changes that will need to be made going forward, based on the feedback from their participants and how well their prototype met their success criteria.



Further Reading and References

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