# Levels 7/8 Health and Physical Education Activity

## Understanding Our Food – Food Labels

## Introduction to Numeracy in Health and Physical Education

Health and Physical Education (HPE) is an interdisciplinary learning area that brings together a number of subject areas: health education, home economics, physical education, and outdoor education. Numeracy is an essential skill that is required for working towards the learning outcomes and achievement standards in each of the aforementioned subject areas. The Victorian Curriculum and Assessment Authority (VCAA) has conducted an audit that, together with this resource, will help you to understand the numeracy demands of HPE as well as develop learning activities that will support students’ numeracy development. In seeking to further understand the numeracy requirements of HPE, it is important to review the HPE curriculum documentation, including; the propositions, aims, sub-strands, content descriptors, and achievement standards.

Whilst having an overview of the broader curriculum is important, there are key sections that are particularly relevant and helpful when working to strengthen the development of numeracy in HPE. The first place to start is with the [five key propositions that underpin HPE](https://victoriancurriculum.vcaa.vic.edu.au/health-and-physical-education/introduction/rationale-and-aims). The propositions are interrelated research-based concepts that should inform the development of our thinking as we contemplate planning for learning in HPE (Lambert, 2017; Macdonald, 2013).

The propositions are:

* Focus on educative purposes
* Take a strengths-based approach
* Value movement
* Develop health literacy
* Include a critical inquiry approach

The proposition ‘Develop health literacy’ is integral to how we understand the role of numeracy in HPE. Health literacy is considered to be both a personal and community asset and a key determinant of health throughout the life course (Paakkari et al., 2019). According to the VCAA (n.d.-c),health literacy can be understood as:

An individual’s ability to gain access to, understand and use health information and services, in ways that promote and maintain health and wellbeing. The Health and Physical Education curriculum focuses on developing knowledge, understanding and skills, related to the three dimensions of health literacy:

* Functional dimension — including researching and applying information relating to knowledge and services in order to respond to a health-related question
* Interactive dimension — including more advanced knowledge, understanding and skills to actively and independently engage with a health issue and to apply new information to changing circumstances
* Critical dimension — including accessing and critically analysing health information from a variety of sources which might include scientific information, health brochures or messages in the media, in order to take action to promote personal health and wellbeing or that of others

Numeracy is a key concept and skill in health literacy (Nutbeam, 2008) and is essential for the development of children’s/young people’s lifelong health literacy (Lipkus & Peters, 2009). Whilst some researchers (e.g., Alfrey & Brown, 2014) suggest that health literacy tends to be the remit of health education, the reality is that it has application across the other learning areas embedded in HPE (physical education, home economics, and outdoor education). Also, numeracy need not be solely confined to health literacy; there are other learning intentions and numeracy demands in HPE. A good example is the content descriptor in the strand of Movement and Physical Activity, where students are required to “demonstrate and explain how the elements of effort, space, time, objects and people can enhance performance” (VCAA, n.d.-a).

When planning for the development of health literacy and numeracy, it is important to draw connections to the proposition ‘include a critical inquiry approach.’ With this approach, sustained opportunities are provided for students to develop and apply health literacies (and numeracies) in their learning (Leahy et al., 2016).

## Developing Numeracy Understanding in HPE

One of the best ways to identify the numeracy demands in HPE is to consider the suggested focus areas in tandem with the aims statement for the learning area. The other place to consider is the focus areas where the context for achieving the aims of the subject area and therefore developing and refining numeracy skills are outlined:

* Personal, Social and Community Health
* Alcohol and other drugs
* Food and nutrition
* Health benefits of physical activity
* Mental health and wellbeing
* Relationships and sexuality
* Safety
* Movement and Physical Activity
* Active play and minor games
* Challenge and adventure activities
* Fundamental movement skills
* Lifelong physical activities
* Rhythmic and expressive movement activities

Learning in each of the contexts (and across contexts) will require a range of numeracy skills depending on the sub-strand(s) focus, the content descriptors, and achievement standards selected. For example, the holistic study of food and nutrition, across the different curriculum levels, requires that students apply statistical, financial, spatial, and quantitative literacies in their learning and assessment work. According to the Australian Curriculum, Assessment and Reporting Authority (ACARA, n.d.),

In Health and Physical Education, students develop numeracy capability when they create, represent and interpret data in spatial, numerical and graphic forms. Students use calculation, estimation and measurement to collect and make sense of information related to, for example, nutrition, fitness, navigation in the outdoors, or various skill performances. They use spatial reasoning in movement activities, and to develop concepts and strategies for individual and team games, sports or recreational pursuits. Students interpret and analyse health and physical activity information using statistical reasoning, identify patterns and relationships in data to consider trends, draw conclusions, make predictions and inform health behaviour and practices. Analysing numerical data enables students to elicit, interpret and analyse evidence, critically evaluate claims, provide specific analytical feedback and supports students to develop a deeper understanding of health and movement concepts.

Lesson Plan: Understanding Our Food – Food Labels

Numeracy is a key skill requirement if students are going to be able to successfully engage with food labels. The following food label activity needs to be scaffolded into a broader unit of work about food – Understanding Our Food: Food Environments, Packaging, and Labels. The unit of work is based on content descriptors taken from all of the sub-strands in the Personal, Social, and Community strand in an attempt to engage students in learning about local food environments, food packaging claims and the content of the food that they eat.
The unit of work is informed by four HPE curriculum propositions. It focuses on educative purposes, is strengths based and develops students’ health literacy (and numeracy) via a number of critical inquiry tasks. There is also an opportunity to connect to other learning areas, general capabilities and cross curriculum priorities (e.g., Geography, Science, Design and Technologies, Personal and Social Capabilities, Sustainability). The approach that we advocate, aligns with guidance from researchers who suggest that traditional approaches to learning about food and nutrition, can negatively impact young people’s health and sense of themselves and their bodies (Welch & Leahy, 2018).

Here, the focus is on one activity from the theme Understanding Food Labels. The activity is derived from the content descriptor “Investigate and select strategies to promote health, safety and wellbeing” (VCAA, n.d.-b, VCHPEP126). As previously mentioned, it is just one of the activities that would need to be included under this theme, given the range of sub-strands and content descriptors included. To complete the food label activity, students will need to either already have an understanding of key nutrients and food groups, or will need to develop their understanding as part of the learning sequence. The activity involves students collecting a range of snack food packages (data) that they can analyse to compare, contrast, and rank items, based on their nutrient value and cost. Once students understand nutrients and food labels, you would then ask students to explore other aspects of packaging, including the health claims made on the package and/or marketing strategies. Finally, students could complete an audit of snack options available in a local food outlet (e.g., a vending machine, the canteen, a local shop) to analyse how environments impact food choice.

## Prerequisite/Corequisite Knowledge: Health and Physical Education

* Familiarity with the [Australian Guide to Healthy Eating](https://www.eatforhealth.gov.au/guidelines/australian-guide-healthy-eating) and the [Recommended Daily Intakes](https://www.nrv.gov.au/dietary-energy) (RDIs) is critical to completing this task
* Additionally, students will need to be familiar with:
* [The components of a food label](https://www.foodstandards.gov.au/industry/labelling/Pages/default.aspx)
* [Reading food label](https://www.foodstandards.gov.au/consumer/labelling/Pages/interactive-labelling-poster.aspx)s
* [Nutrition information panels](https://www.foodstandards.gov.au/consumer/labelling/panels/Pages/default.aspx)

## Background Mathematical Skills and Understandings

Health and Physical Education teachers are not expected to teach the mathematical knowledge and skills that students will draw on when engaging with this activity. The students will have learnt and should be adept with the required mathematical knowledge and skills to complete the activity. According to the Victorian Curriculum Mathematics, the required mathematical knowledge and skills should have been developed in earlier years of schooling, that is, by the end of Level 6.

For this activity, the background mathematical knowledge and skills needed to complete the activity are:

* Identifying pertinent numerical data in context
* Collecting and collating multiple data points
* Knowledge of units of measurement
* Converting units of measurement
* Rank ordering of data (from highest to lowest and from lowest to highest)
* Calculating range
* Calculating percentages (with and without calculators/other technologies)
* Developing fractions
* Displaying data in column graphs, dot plots, and tables (with and without using technology)
* Describing and interpreting datasets and displays
* Students may need some assistance with terminology associated with the activity, such as “best nutrient value” and “best value for money.”.

## Lesson Description

The sequence of activities should be completed in small groups of three to four students.

### Collecting Snack Food Packages

In small groups, students should be given a choice of packaged snack categories on which to focus their investigation. For instance, students could select chips (crisps), instant noodles, biscuits/crackers, muesli bars, cake, nuts, dried fruit, or popcorn. Choice is important here so that diverse tastes can emerge within each of the categories. Students may also want to select their own category of snack. If so, the only conditions are that the snack must be packaged and that there must be several different varieties of it available. Once a group has made its decision about which category they are going to study, students need to collect the required data to complete the task. Students will need to identify five different varieties (e.g., five brands of instant noodles) and collect the following information:

* Images of the package and nutrition information panels
* Cost

### Comparing, Contrasting, and Ranking Snacks

Once groups have their data, they need to complete the following tasks (drawing on their pre-requisite/co-requisite understandings) and prepare a presentation based on their responses to the questions.

### Comparing Serving Size

* Based on the serving size per package and serving size recommendations, what is the serving size and how many servings are included in each pack?
* Are there variations in serving sizes? What are they?
* Explain your answers

### Energy

* Rank the snacks in order from highest to lowest energy per serving (kJ)
* What is the range of energy per serving?
* Based on the energy per serving for each item, what is the percentage daily intake per serving, based on the different ages/sexes of your group members?
* How does your energy percentage RDI vary from an adult’s?
* Suggest reasons why RDIs for energy intake might vary between different groups
* Explain your answers

### Fibre, Sodium, and Sugar

* Rank the snacks in order from highest to lowest amount of fibre, sodium, and sugar per serving
* How do the amounts vary for each product per serving?
* What is the percentage daily intake per serving based on the different ages/sexes of your group members?
* What might be the reasons that nutritionists would suggest for choosing a snack that is high in fibre, low in sugar, and low in sodium?
* Explain your answers

### Cost

* How much does each item cost?
* Which item provides the best value for money (i.e., cost per 100 grams)?
* Which snack provides the best nutrient quality for money (i.e., best aligns with the requirements of the Australian Guide for Healthy Eating for the best price)?
* Explain your answers

### Class Presentations

Students prepare and present a report to the class based on their responses to the prompt questions. As students listen to the various presentations, they need to take note of the different findings from each of the groups, to prepare a reflection on:

* The ways that different groups represented their responses
* How they could represent their findings differently/better
* The limitations of the task (e.g., focusing only on packaged items) and how they could improve the task

### Making Recommendations

Finally, based on class findings, students need to make a list of snack recommendations that should be included in vending machines and/or the school canteen. Students will need to review the data and make their decision based on overall nutrient quality of the different snack categories and items. Students need to justify their recommendations.

### Concluding Comments

You may want to ask students to consider other nutrients on the food label (e.g., fat) as part of the investigation. Once students have completed the labelling task, you need to move on to an exploration of other features of packaging (and advertising) and then on to what would be the final activity – the food environment audit. You may want to introduce a critical inquiry question, related to sustainability, by asking students to research and then comment on the packaging of the snacks. Alternatively, you could ask students to look more closely at the ingredients list or where the snack was made.

Table 1: Links to the Victorian Curriculum – Health and Physical Education

|  |  |  |
| --- | --- | --- |
| Strand and Sub-Strand (if applicable) | Content Description (Code) | Elaboration(s) |
| Personal, Social and Community HealthBeing Healthy, Safe and Active | Investigate and select strategies to promote health, safety and wellbeing (VCHPEP126) | [Adapted Elaboration] Researching a variety of snack options, evaluating nutritional value, value for money (via analysis of food labels and price), and proposing a snack menu for the canteen/vending machine |
| Communicating and Interacting for Health and Wellbeing | Develop skills to evaluate health information and express health concerns (VCHPEP129) | [Adapted Elaboration] Analysing the credibility of health messages conveyed by different sources (e.g., media, packaging) |
| Contributing to Health and Active Communities  | Plan and use strategies and resources to enhance the health, safety and wellbeing of their communities (VCHPEP130) | [Adapted Elaboration] Auditing snack options available at a vending machine, canteen, or local shop and producing a guide that ranks the snacks based on a range of factors such as price, nutrient value, and positioning/visibility  |

Table 2: Links to the 21st Century Numeracy Model (Goos et al., 2014)

|  |  |
| --- | --- |
| Aspect of the Model |  How This Aspect is Addressed by the Lesson |
| Attention to Real-Life Contexts* Citizenship
* Work
* Personal and Social Life
 | Students will select and apply mathematics, relevant to the context of popular snack items, with a focus on nutritional information and cost. Specifically, students will recognise the numeracy demands in comparing nutritional information from multiple varieties of the same type of snack food.  |
| Application of Mathematical Knowledge* Problem Solving
* Estimation
* Concepts
* Skills
 | Students can make use of, and sense of, the mathematics involved in examining the food labels. Students will use mathematical skills such as, calculations of range and unit price, while completing the activity. |
| Use of Tools* Physical
* Representational
* Digital
 | Students will use representational (e.g., graphs, tables) and digital (e.g., computers, calculators) tools during this activity. Specifically, they will use digital tools while completing the required calculations, and representational tools when they present their findings to their classmates. |
| Promotion of Positive Dispositions* Confidence
* Flexibility
* Initiative
* Risk
 | Since snack food is a context with which students are familiar and have everyday experiences, they will feel confident to use mathematics to interpret food labels and analyse nutritional and cost information. Since the task is open-ended in nature, students will have the opportunity to show creativity and to work in flexible ways, to answer the questions. Furthermore, by working in peer groups, students will feel supported to take mathematical (and other) risks while completing this activity. |
| Critical Orientation* Interpreting Mathematical Results
* Making Evidence-Based Judgements
 | Students will develop an interpretive, evaluative and analytical stance, towards understanding food and food labels. They will form evidence-based opinions and make judgements or decisions to understand how healthy food choices can be enabled or constrained by food environments. By applying their critical orientation, students will be able present arguments during the concluding portion of the lesson, through an informed discussion of their and their classmates’ findings. |

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