# Levels 9/10 Health and Physical Education Activity

## Fit for Life – Understanding Fitness

## 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: Fit for Life

Numeracy is a key skill requirement if students are to successfully further develop and apply key knowledge and skills associated with the focus theme, Fit for Life. Both the Movement strand and the Personal, Social and Community strand, include multiple sub-strands in order to engage students in a broad study of fitness and what it might mean for themselves and others in the community. Students will learn about the health benefits of physical activity and the different ways that they could approach maintaining or improving selected dimensions of fitness that are important to them. The sequence is informed by the five HPE curriculum propositions: it includes a focus on educative purposes, is strengths-based, values movement, and develops students’ health literacy (and numeracy) via a number of critical inquiry tasks. We have made a deliberate decision to take a different path to learning about fitness, eschewing traditional forms of fitness testing and embracing contemporary thinking about learning in the area of HPE (Leahy et al., 2016). The approach that we advocate is aligned with suggestions from international researchers who posit that traditional approaches to learning about health, fitness education, and fitness testing in particular, can negatively impact young people’s health and sense of themselves and their bodies (Alfrey, 2020). We focus on one activity – Understanding Fitness. This activity is just one of several activities that you would need to include under the focus theme, Fit for Life, given the different strands and content descriptors.

## Prerequisite/Corequisite Knowledge: Health and Physical Education

To complete the Understanding Fitness activities, students will need to have had the opportunity to have examined (or will examine using the suggested scaffold):

* The health benefits of physical activity (e.g., social, mental, physical, spiritual, environmental)
* Different definitions and components of fitness and training principles
* Changing meanings of fitness – past and present. It is important to provide students with an opportunity to investigate how meanings vary, depending on a range of factors, including; lifespan stage, culture, class, ability, and gender. Such an investigation could be undertaken through conducting a survey, interviewing an older relative, or analysing media
* What and how sociocultural and ecological factors influence fitness

## 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 8.

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

* Knowledge of measurement units
* Converting units of measurement
* Choosing appropriate units to measure
* Identifying and using appropriate tools/instruments for measurement
* Making accurate measurements using appropriate tools/instrument
* Recording and interpreting measurement data
* Using appropriate mathematical processes to calculate change in measurements over time
* Knowing that data can be represented in different ways
* Representing and comparing measurement data in graphical and tabular formats (with and without the use of technology)
* Comparing, contrasting, interpreting, and evaluating multiple data representations

## Lesson Description

Ask students to identify the kinds of movement and/or physical activities in which they engage and/or of which they are aware (e.g., rollerblading, yoga, dancing, skateboarding, surfing, snorkelling, walking, trampolining, football). The inclusive framing of the task here is important. With a diversity of choices available, the students are provided with an authentic context for their learning. Furthermore, students who may not be currently active will have an opportunity to select an activity that they might have enjoyed doing in the past and may again enjoy in the future. Alternatively, the activity might be one that students enjoy watching.

Provide the students with the following guiding questions:

* What are the possible health benefits of the selected activity?
* What are the top three components of fitness that are necessary to participate in your selected activity? Justify your response
* If you wanted to improve the three selected components (so you could feel better whilst participating and/or improve your performance), what principles of training and training methods could you apply and why?
* Based on this plan, how might you measure and represent change over time (e.g., pre-test/post-test comparisons, graphs)? Describe three tests (existing and/or your own) and explain what you are measuring, how you are measuring, and how you will keep track of changes over time (e.g., a change in feeling, a change in score)
* Once you have decided how you could measure the components of fitness and changes over time, conduct your first round of testing on yourself (by gathering data)

### Working with Data

Once students have collected their pre-test data, ask them to present their approach to testing to a small group of students (Note: This step is not about sharing their personal results).

In the small group, ask students to report on:

* The activity and fitness components on which they have been focusing, what their plans are to improve the three components, what they are going to test, and why and how they are planning on measuring change
* The pre-test that they conducted
* How they are going to represent the data from the pre-test (in what form? – they should provide possible examples for the group to consider and discuss)
* Reflections on the test itself (e.g., What worked well? Why? What might you do differently? What did the process of data collection and analysis reveal about the approaches to fitness, testing and measurements that they chose?)

### Planning for Fitness Report

Once students have completed their small group activity, they can finalise their individual report, which will include responses to the inquiry questions. Students should also include their pre-test scores and plan for measuring change over time (including how they are going to collect, organise, and display those data, as well as questions that would guide their data analysis). To conclude the report, students should critically reflect on contextual factors that could impact their plan to improve fitness (i.e., they should be directed to discuss social and physical enablers and barriers to physical activity – gender, access, time, facilities, geographic location, climate, etc.). Please note that it is important that the individual report is not made part of a class presentation or open to public scrutiny.

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

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| --- | --- | --- |
| Strand and Sub-Strand  (if applicable) | Content Description (Code) | Elaboration(s) |
| Movement and Physical Activity  Understanding Movement | Design, implement and evaluate personalised plans for improving or maintaining their own and others’ physical activity and fitness level (VCHPEM155) | Justifying the selection of physical activities included in a personalised plan linked to the components of health- and skill-related fitness they wish to improve or maintain |
| Movement and Physical Activity  Understanding Movement | Examine the role physical activity, outdoor recreation and sport, play in the lives of Australians and investigate how this has changed over time (VCHPEM157) | [Adapted Elaboration] Investigating the varied perspectives held by Australians on sport and examining how diversity is represented in the myriad of physical activities currently available |
| Personal, Social and Community Health  Being Healthy, Safe and Active | Identify and critique the accessibility and effectiveness of support services based in the community that impact on the ability to make healthy and safe choices (VCHPEP145) | [Adapted Elaboration] Evaluating the influence of personal, family, social, environmental, and cultural factors, that shape how we come to understand fitness and what activities are available to us |
| Communicating and Interacting for Health and Wellbeing | Evaluate health information from a range of sources and apply to health decisions and situations (VCHPEP148) | [Adapted Elaboration] Critiquing and selecting the most suitable and reliable sources of health information related to planning for physical activities to enhance health and fitness |

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

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| 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 health, specifically movement and/or physical activity, as well as the broader concept of fitness. For example, they will recognise the numeracy demands in measuring and comparing one’s fitness to partake (and improve) in a particular activity. |
| Application of Mathematical Knowledge   * Problem Solving * Estimation * Concepts * Skills | Students can make use of, and sense of, the mathematics selected by using it to examine the fitness requirements of chosen activities. Students will have interpreted fitness, as well as improvements in fitness levels, in a mathematical way in order to select the relevant mathematical knowledge to measure key variables (e.g., speed, distance). |
| Use of Tools   * Physical * Representational * Digital | Students will use physical (e.g., trundle wheels, measuring tapes), representational (e.g., graphs, tables), and digital (e.g., calculators, spreadsheet programs) tools to explore fitness in the chosen activities. Students will use these tools to collect data and to analyse the changes in fitness, per the selected measurements. |
| Promotion of Positive Dispositions   * Confidence * Flexibility * Initiative * Risk | Students will feel confident to show initiative to select, use, and interpret mathematics in their investigations of fitness in their selected activity. Through selecting an activity with which they are familiar, students will have confidence to explore the topic in a mathematical manner. Additionally, the open-ended nature of the task allows students to be creative in not only their choice of topic, but also the manner in which they explore it, mathematically. |
| Critical Orientation   * Interpreting Mathematical Results * Making Evidence-Based Judgements | Students will develop an interpretive, evaluative and analytical stance, towards understanding the concept of fitness. Using their own data, students will form evidence-based opinions and come to understand how the local environment and other factors (e.g., SES) support or constrain the development of fitness in chosen activities. |

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