

FUELLING PERFORMANCE



Introduction

For PE GCSE, students are required to know the role of carbohydrate, protein and fat in a balanced diet; the principle of carbohydrate loading and protein timing around exercise; the importance of hydration; as well as understanding how athletes meet elevated energy and nutrient demands. This standalone task can be inserted to an existing lesson, or even as an independent research task (if you have introduced the concept of balanced diet ratios) and explores the foundational ratio and intensity content directly. It has students research and apply the carbohydrate timing, protein timing and hydration principles. The Vegan Society's published guidance on sports nutrition is supported by the British Dietetic Association (BDA) and in-house Nutrition Team. The vegan framing in this task offers key content while also giving the perspective of a vegan athlete.

Relevant Links

Fuelling an active lifestyle – [The Vegan Society](#)

Protein fact sheet – [The Vegan Society](#)

Vegan and Thriving campaign – [The Vegan Society](#)

Nutrition and Health – [The Vegan Society](#)

Nutrition overview – [The Vegan Society](#)

TASK OVERVIEW

Timing
25–25
minutes

Setting
classroom

Curriculum links

AQA GCSE Physical Education (8582): (3.2.3.3)

Energy use, diet, nutrition and hydration.

Pearson Edexcel GCSE (9–1) Physical Education:

(1.3) Energy use, diet, nutrition and hydration.

OCR GCSE (9–1) Physical Education (J587): (2c.2.)

Diet and nutrition.

What you'll need

Student Research Worksheet

Additional resources

Pens, laptops/tablets

Before the lesson

- Ensure you have laptops/tablets for the lesson, 1 per pair.
- Print one Student Research Worksheet per student.

Learning Objectives

1. To understand key nutritional information and apply it to plan meals for an athlete.

Note on framing: keep the framing evidence-led throughout. The task is not designed to persuade students that a vegan diet is best for athletic performance – only to demonstrate, with real nutritional figures, that it can meet an athlete's needs when planned deliberately.

The Task

Timings are a guide – adjust them to suit your class.

Introduction – [3 minutes]

- Start by briefly recapping (or introducing, if new) the balanced diet ratio and the carbohydrate/fat distinction.
- Then move on to introduce the research task and explain that this task is through a vegan lens.

Suggested teacher script

- It is important to know that a balanced diet contains roughly 55–60% carbohydrate, 25–30% fat and 15–20% protein. These are known as macronutrients and offer the vast majority of our daily calorie intake.
- The main and preferable energy source is carbohydrate for all exercise intensities. Although, fat is also an energy source and perhaps surprisingly provides more energy per gram than carbohydrate, but the body can only access it efficiently at low intensity.
- This task is going to use content from The Vegan Society, where their dietitians use evidence-based health information and are registered members of the British Dietetic Association.¹
- Before we start, let's consider where a vegan athlete would get each of these three macronutrients from? [take a few quick verbal answers to gauge early knowledge].

Task – Part A – [15 minutes]

Resources: laptop/tablet per pair and the Student Research Worksheet.

- In pairs, students will visit two pages on The Vegan Society's website – see below.
- There is a Student Research Worksheet which has

a number of questions for them to work through, gathering useful and reliable information.

- For the answers, see Appendix A.

Webpages for research task

Page A – Fuelling an active lifestyle: <https://www.vegansociety.com/fuelling-active-lifestyle>

Page B – Protein: <https://www.vegansociety.com/protein-download>

Suggested teacher script

- You will now work in pairs to research key information about a balanced diet for athletes. There are two pages that have all the answers you need so as you go through each question, it is worth skimming the webpage to find the correct section.
- Fill in your research worksheet as you go as you will need it for the next part of this task. You should record which page you find the information on, this will be useful if you need to refer back to it afterwards.

Task – Part B – [10 minutes]

- Once students have completed the research task, they will continue working in their pairs to apply their newfound knowledge – building a day's meals for a vegan athlete.
- The teacher can dictate which athlete profile each pair plans for – an endurance athlete (e.g. a distance runner) or a strength athlete (e.g. a weightlifter) – and the body weight of the athlete (e.g. 70kg).
- Students will use their research sheet to help them plan – referring to a mix of carbohydrate rich foods, the protein-per-kg figures and an iron/vitamin C pairing.
- The day's meals should land within the athlete's target protein range.

Athlete profile	Daily protein requirement	Compared to general population
General sedentary population	0.8–1.0g per kg bodyweight per day	Baseline
Endurance athlete	1.2–1.8g per kg bodyweight per day	Higher
Strength athlete	1.2–2g per kg bodyweight per day	Higher still

Source: [Fuelling an active lifestyle](#) (published by the British Dietetic Association on The Vegan Society website).

¹ The Vegan Society's in-house dietitians are registered professionals.

Consolidation – [5 minutes]

- To close the task, cold-call on a few pairs to share their meal plan, ensuring they justify their protein target.
- Use questioning to ensure that they have met the athlete's needs and consider asking whether they are surprised by the content they have learnt today.

Potential questions to ask

- Now that you have spent time looking into the nutritional requirements of athletes, where would a vegan athlete get each macronutrient?
- Was there a particular meal that was the easiest to meet the athlete's nutritional needs?

Differentiation

Support – depending on the student's needs, you could reduce the worksheet to only researching questions 1, 2, 3 and 6. Pair with a supportive student so that the meal planning task can be a structured discussion.

Stretch – ask students to repeat their plan for the other athlete profile (e.g. strength rather than endurance or vice-versa).

Note: Appendix A on next page



APPENDIX A *Completed table for Student Research Worksheet*

Question	Answer	Page A/B?
1. How many grams of protein per kg of bodyweight does the British Dietetic Association recommend for strength athletes?	1.2–2g per kg bodyweight per day.	A
2. How does this compare to the recommendation for endurance athletes, and for the general sedentary population?	Endurance athletes need less than strength athletes (1.2–1.8g/kg) but more than the general sedentary population (0.8–1.0g/kg).	A
3. List five foods described as good sources of carbohydrate for fuelling exercise.	Oats, potato, brown rice, wholewheat noodles/pasta, wholemeal bread, fruit.	A
4. What type of meal does the page recommend eating 2–3 hours before intense training, and again as soon as possible afterwards?	A light meal that's carbohydrate-rich with moderate protein and lower fat. <i>This is the principle behind two concepts: carbohydrate loading for endurance athletes (eating extra carbohydrate before sustained exercise to maximise fuel stores) and timing of protein intake for power athletes. The page doesn't use the terms directly, so it's worth naming both explicitly when reviewing this answer as a class.</i>	A
5. Name four 'double-duty foods' and explain what makes a food count as one.	Beans, lentils, peas, wild rice, buckwheat, amaranth, quinoa, popped corn, hemp seeds. A double-duty food contains good-quality protein together with a useful amount of another nutrient, such as carbohydrate or fat.	A
6. What nutrient should be eaten alongside iron-rich food to help the body absorb the iron? Give one example meal combination.	Vitamin C. Example combinations given on the page: tofu stir-fry with broccoli, bean chilli with bell pepper, chickpea curry with pineapple.	A
7. After how many minutes of training does the page suggest a drink containing carbohydrate and electrolytes becomes useful, rather than water alone?	60–90 minutes.	A
8. Find the protein content (in grams) of these: 100g tofu, 80g cooked red lentils, 80g tinned kidney beans, 80g tinned chickpeas, 25g peanut butter.	100g tofu – 8g; 80g cooked red lentils – 7g; 80g tinned kidney beans – 6g; 80g tinned chickpeas – 6g; 25g peanut butter – 6g.	B
9. What two ingredients (plus a pinch of salt) make up a home-made sports drink, according to The Vegan Society?	Water and fruit juice or squash, plus a pinch of salt. Option 1: 800ml water + 200ml full-sugar fruit squash + pinch of salt; or option 2: 250ml water + 250ml fruit juice + pinch of salt.	A