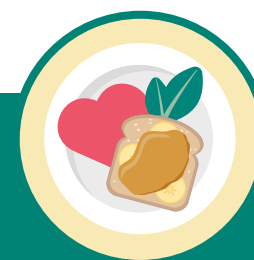


THE POWER OF PLANTS



Introduction

This lesson introduces students to the key nutrients found in plant-based foods and builds the knowledge they need to make informed nutritional judgments. It is designed to spark hope, curiosity and excitement about plant-based eating – not to preach. The emphasis throughout is on abundance: the range, variety and nutritional depth of plant foods, rather than what might be missing from a vegan diet.

The lesson follows an I do/We do/You do structure. During the I do segment, six nutrients are covered by the teacher, supported by a partially completed reference sheet. The We do asks pairs to analyse one of three plant-based meals and share findings with another pair. The You do is an independent design task where students create their own nutritionally balanced plate. The plenary uses a quick-fire thumbs-up/thumbs-down format to consolidate learning.

Standalone note: This lesson is written to stand alone – it does not require students to be doing the practical lesson. However, if you would like to run the practical lesson, please see the link on our website – Coconut Dhal – Practical Lesson.

Relevant Links

Content on nutrition – [The Vegan Society](#)

Peanut butter and banana on toast recipe – [The Vegan Society](#)

Coconut dhal recipe – [The Vegan Society](#)

Cauliflower mac 'n' cheeze recipe – [The Vegan Society](#)

VEG 1 nutrition FAQs – [The Vegan Society](#)

LESSON OVERVIEW

Timing

60 minutes

Setting

classroom

Curriculum links

Cooking and nutrition KS3

- "Understand and apply the principles of nutrition and health."
- "Understand the source, seasonality and characteristics of a broad range of ingredients."

What you'll need

Slide Deck KS3-2 – The Power of Plants, What's in Our Food? Worksheet, Meal Card Ingredients Lists, Plate Worksheet.

Additional resources

Pens, mini whiteboards or scrap paper for the starter, coloured pencils for the plate worksheet.

Before the lesson

- Print the What's in Our Food? Worksheet (1 per student).
- Print the Meal Card Ingredients Lists and then cut into three. (There are three menus per page, so print 10 for a class of 30.) Alternatively, use slide 12 to avoid printing.
- Print the Plate Worksheet (one per student). Or students can draw directly in their book if preferred.

Learning objectives

1. Identify key nutrients found in plant-based ingredients and explain how they support a healthy diet.
2. Evaluate the nutritional value of a range of plant-based ingredients.



THE LESSON

Timings are a guide – adjust to suit your class.

Slide 1 – Title page

Starter - [10 mins]

Resources: Mini whiteboards or scrap paper

Slide 2

The activity

- Show six close-up images of: ginger, red lentils, tomato, chia seeds, spinach and turmeric root.
- Students attempt to identify the foods and write their guesses silently on mini whiteboards or scrap paper. No discussion yet.
- After 60–90 seconds, for each photo in turn, take hands up then reveal the correct answer. Use the reveal to drop one surprising fact per ingredient. Keep it punchy – one sentence each.

Potential script

- Look at the six images on the screen. Write down what you think each one is – silently, on your own. You've got 60 seconds.
- **Ginger** – has been used in cooking for over 5,000 years and is one of the oldest spices in the world. It also contains compounds being researched for their potential anti-inflammatory effects.
- **Red lentils** – A good source of protein, when cooked (cooked lentils can contain about 9 g of protein per 100 g). Eaten internationally, especially across South Asia, the Middle East and Africa, for thousands of years.
- **Tomato** – A fruit, not a vegetable! Originally from South America, tomatoes are rich in vitamin C – which turns out to be very important for iron absorption.
- **Chia seeds** – Small, but contain several important nutrients such as omega 3 fat, protein and calcium, to name a few – making them a nutritionally dense food... Originally from Central America.
- **Spinach** – Good source of plant-based Iron, although the body does not absorb it very well without a little help! – We'll learn that trick today!
- **Turmeric root** – This is where turmeric powder comes from. Used in cooking and medicine for over 4,000 years, it gives foods such as curries a yellow colour.

Potential questions

- What else do you know about these plants?
- Any nutrition facts?
- Where does it grow?
- Do you know any dishes it's used in?

Slide 3

The activity

- Introduce the learning objectives and key terms.

Task – I do [15 mins]

Resources: What's in Our Food? Worksheet (1 per student).

Slide 4

The activity

- This section of the lesson is teacher led and an active listening/note-taking exercise.
- Exaggerate pauses and clearly state 'write that down' to help form their note-taking skills.
- Slides 5–10 each show a different nutrient source. The teacher will deliver key information about each one.
- On the worksheet, the first two columns are already filled. The students need to complete the next two columns: What does it do? and Plant-based sources. The final column is for a separate task later in the lesson.
- Give a chance for pairs to check in with each other at the end and add any missing information.
- Choose which question is most suited to your class from the options below:

Differentiation

Support – The reference sheet already has some sections filled in so that all students will leave with the basic nutritional information.

Challenge – Use scientific language to explain the nutrients and processes and encourage the students to do the same.

Potential script

- This is a listening task. I'm going to tell you key information about these nutrients, and you'll write it in your own words on the worksheet.
- The first two columns are filled in. Your job is to complete 'What does it do?' and 'Plant-based sources'. You'll



hear some of these from me, although some you might already know.

- I think the interesting thing to note here is that often we know the meat or dairy sources for these nutrients, but plants are able to give us these key nutrients, too!

Slide 5 – Protein

- First one – protein. You’ve heard of it. But what actually is it? It’s a macronutrient – one of the big three, alongside fat and carbohydrate. Your body uses it to build and repair things – muscles, bones, skin, hair, organs.
- Every time you grow – a bit taller, a bit stronger – protein is doing that work. Every time you recover from exercise, protein rebuilds what got broken down. Without enough of it, that process just doesn’t happen properly.
- In your ‘What does it do?’ column, the core of what you need to write down is “build and repair”. Try to include an example from what I’ve said.
- Some plant-based sources are: lentils, chickpeas, tofu. Write two or three.
- **Stretch:** One thing worth knowing – different plant foods contain different amounts of the building blocks (amino acids) that your body needs. This is why eating a variety of plant foods across the day is important – this will help us get all the building blocks we need by the time the day is finished! Don’t worry about memorising that. Just know it’s solvable.

Slide 6 – Iron

- **Iron.** Quick question – where do most people think iron comes from? [Take responses – meat will come up]. Yeah, meat. Specifically red meat. And that’s not wrong – but it’s not the whole picture.
- Here’s what iron actually does: it makes haemoglobin. Haemoglobin is the protein in your red blood cells that picks up oxygen in your lungs and carries it to every cell in your body. Every single one. If your iron is low, that delivery system slows down. You feel exhausted. You can’t concentrate. Severe iron deficiency is called anaemia – it affects hundreds of millions of people worldwide, and it’s actually the most common nutrient deficiency on the planet.
- In the ‘What does it do?’ column, write about oxygen delivery and what happens without it.
- Plant-based sources of iron include: spinach, lentils,

fortified cereal, dried figs and apricots, beans and tofu... Get two or three down.

- Now, plant iron is actually called non-haem iron, and it’s absorbed differently to the iron found in meat. However, I’m going to tell you something in a few minutes that can help improve absorption.

Slide 7 – Calcium

- **Calcium.** Where does calcium come from? [Take responses – dairy will dominate.] Right – dairy. That’s the one everyone knows. But here’s what most people don’t know...
- Calcium is the most abundant mineral in your entire body. About 99% of it is locked in your bones and teeth – that’s what gives them their hardness and density. And here’s why this matters for you specifically: you are at the age when your bones are still being built. Adolescence is when you establish what’s called your peak bone mass – the maximum density your bones will ever reach. What you build now, you largely keep. So, this nutrient is particularly important right now, not in 20 years.
- But calcium doesn’t just build bones. It’s also needed for every muscle contraction, including your heart, which contracts about 100,000 times a day. And for nerve signals – the electrical messages your brain sends to your body.
- So what does it do? Bones and teeth, yes, but also muscles and nerves. Write down the functions I’ve just mentioned.
- Some vegan sources are: broccoli, kale, almonds, white beans and fortified plant-based milk. And if you see calcium sulphate in the ingredient list for tofu, that’s calcium-set tofu – a great source.

Slide 8 – Vitamin B12

- This is the one nutrient that needs specific thought for a plant-based diet.
- **Vitamin B12.** It’s needed to make red blood cells and to maintain something called the myelin sheath – the protective coating around your nerve fibres. Without that coating, nerve signals don’t travel properly. Prolonged B12 deficiency can cause irreversible nerve damage, which is serious.
- Now, here’s the thing I said we’d need to think carefully about. B12 does not occur naturally in any plant food.



Not in small amounts. Not at all. It's produced by bacteria in soil and water, and animals accumulate it through their diet. Plants don't. So, if someone eats entirely plant-based food and doesn't think about B12, they will eventually become deficient.

- The good news – and it is genuinely good news – is that it's easy to address. Fortified plant milks, fortified cereals, nutritional yeast. It's added to lots of everyday foods. You just have to read the label.
- Many vegans also choose to take Vitamin B12 supplements as part of a healthy, balanced vegan diet.
- [Check the students' understanding of supplements: What is supplementation? Take answers.] Supplements can be taken as tablets or in liquid form, depending on the vitamins and minerals included, and they support your diet.
- The Vegan Society offers vitamin and mineral supplement VEG 1, which includes not only vitamin B12 but also other important vitamins and minerals, such as selenium, which helps protect our bodies against cell damage and infection, and iodine, which helps balance our hormones.
- In the 'What does it do?' column, mention the nervous system and red blood cells. Note that it doesn't occur naturally in plant foods but that supplementation or fortified foods fulfil our nutritional needs.

Slide 9 – Omega 3

- Omega 3 is an essential fatty acid. The word 'essential' in nutrition has a specific meaning – it means the body cannot make this substance itself. You have to eat it. If you don't, you don't get it.
- Omega 3 is a type of fat – a polyunsaturated fat, one of the fats that's actually good for you. Most people associate it with oily fish. And fish do contain it. But so do plants!
- Remember those tiny chia seeds from the starter? Full of omega 3. So are walnuts. So is ground linseed.
- What does omega 3 do? It supports brain function. And this is the part that tends to surprise people – your brain actually contains omega 3 fat as part of its physical structure. It's built into the tissue. It also supports eye health, specifically the retina, and reduces inflammation throughout the body.
- In the 'What does it do?' column, add brain, eyes, inflammation.

- **Stretch:** how do fish end up containing omega-3? Because they eat algae! Humans can also get omega-3 from algae and some vegans do in the form of supplements.

Slide 10 – Vitamin C

- The last nutrient is vitamin C, which supports the immune system and is also involved in making collagen – the structural protein that holds your skin, blood vessels, cartilage and joints together.
- But do you remember what I said about plant-based iron? [Take a hand up – plant-based iron is harder to absorb.] Well, vitamin C helps the body absorb iron from plants more effectively... Specifically, ascorbic acid converts iron from a form the body can't absorb into a form it can. So, for example, spinach with tomatoes. Lentils with lime juice. Chickpeas with peppers. You're not just adding flavour – you're unlocking iron. The science is working in our favour.
- In the 'What does it do?' column, let's put immune system, collagen and – most importantly – iron absorption. Write that connection down!
- What are some of the sources I've just mentioned? [Tomatoes, citrus fruit, peppers] And red peppers, by the way, contain more vitamin C by weight than oranges.

Continued... potential script

Stretch - If you have time, mention Iodine. Iodine can be found in plant-based milks (not all, check the label) and in seaweeds. Some vegans choose to take an iodine supplement as part of a healthy, balanced diet.

- Now, swap sheets with your partner and ask them if you've missed anything.

Choose

1. Turn to your partner. From memory, name one nutrient and one plant-based source of that nutrient – 60 seconds, no notes.
2. Show an image of Fiona Oakes and ask: "As a vegan athlete, which of the six nutrients do you think powers her performance?" [Give 60 seconds for thinking, allow the students to refer to their sheets and then cold call 2–3 responses.]



Task – We do [18 mins]

Resources: Meal Card Ingredients List (printed or shown on slide 12); students still need the What's in Our Food? Worksheet (from the previous task).

Slide 11

The activity

- Students are paired up to analyse each ingredients list and its nutritional content.
- This section is the 'Think, Pair' segment of a Think, Pair, Share.
- There are questions on the slide for students to work through in their pairs.
- The teacher can circulate to ask questions.

Potential script

- You are going to work in pairs. Your pair has one

meal – you'll see the ingredients on your card (/on the screen). Use your worksheet from the previous task to tick off which nutrients that meal provides.

- Be ready to explain your ticks – not just which box, but why!

Potential questions to ask

- How do you know that ingredient provides iron?
- Is there anything in this meal that surprises you?
- If this meal is missing vitamin B12, how could you fix that?
- Why do you think the recipe pairs tomatoes and lentils?
- **Stretch:** is there anything missing? If so, what? Could you add a pudding or another ingredient that might help?

Answers for Meal Cards

Nutrient	Peanut butter and banana on toast	Coconut dhal	Mac 'n' cheese
Protein	✓ peanut butter, bread	✓ ✓ lentils (strong)	.✓ pasta, soy milk
Iron	✓ wholegrain bread (some)	✓ ✓ lentils + spinach (reference the absorption rate combination)	✗ no major iron-rich ingredient
Calcium	✓ fortified oat milk (if included)	✓ spinach (some)	✓ fortified soy milk
B12	✓ fortified oat milk (if included)	✗ no source	✓ nutritional yeast + fortified soy milk
Omega-3	✗ no source	✗ no strong source	✗ no source
Vitamin C	✓ banana (some)	✓ ✓ tomatoes (strong)	✓ cauliflower (some)



Slide 12 – This is here in case you prefer not to print the Meal Cards Ingredient Lists. You can hide or skip this slide if not needed.

Slide 13

The activity

- Two pairs – ideally with different meal cards – join up to form a four for the 'Share' part of Think, Pair, Share.
- There are discussion questions on the slide to scaffold the small group discussion.

Potential script

- Join up with a pair who had a different meal. Share your findings – which nutrients did your meal provide, what was missing and what would you add?
- Which of the three meals do you think is most nutritionally balanced (provides the widest range of nutrients)? Be ready to argue your answer.

Key knowledge

- The dhal is nutritionally richest overall but has no vitamin B12. The mac 'n' cheese has B12 but is lower in iron and protein. The peanut butter on toast is protein-strong, but B12 depends on also having some fortified oat milk.

Task – You do [12 mins]

Resources: Plate Worksheet

Slide 14

The activity

- Students now use the criteria – protein, iron and vitamin C – to build their own plant-based dish.
- The vitamin C and iron pairing is the key conceptual connection and links back to the key term, the I do activity and the What's in Our Food? Worksheet.
- Students draw and label their meal in their book or on the Plate Worksheet.

Optional extension

- Students could also include plant-based sources of calcium, vitamin B12 and omega 3, or they could consider seasonality in their choice of ingredients.

Potential script

- This task is for you to do on your own now: design a plant-based meal that meets the brief on the slide – at least one source of protein, iron and vitamin C.
- Draw it on your plate worksheet/in your book and label every ingredient. Then, for each nutrient, write which ingredient provides it and why it matters.
- A bonus would be if you can also include plant-based sources of calcium, vitamin B12(!) and omega 3 and/or an ingredient that is in season in the UK at the moment.

Plenary [5 mins]

Slide 15

The activity

- This is a quick-fire round of agree/disagree using thumbs up/thumbs down.
- Students will look at the dish on the screen and judge whether it has each nutrient.

Potential script

- For today's plenary, you need to look at the dish on the screen. There will be six rounds, and I'm going to ask you about one nutrient at a time.
- 20 seconds to think and then I'll countdown – 3, 2, 1 – and you'll put your thumb up if the meal provides the nutrient or thumb down if it's lacking. Everyone reveals at the same time, and I'll ask some of you to explain why. Ready? Let's go!
- [See the six rounds below.]
- You just evaluated a meal for nutritional value. That is food science, and every single ingredient in that bowl is plant-based.

The six rounds (these answers will need editing depending on which meal/picture is found for the slide)

- 1. Protein** – Thumbs up – chickpeas/pumpkin seeds
- 2. Iron** – Thumbs up – spinach/chickpeas
- 3. Vitamin C** – Thumbs up – roasted pepper/lemon juice
- 4. Vitamin B12** – Thumbs down – you could add a fortified milk/cream dressing or nutritional yeast



5. Omega 3 – Thumbs up – chia seeds/ground linseed

6. Calcium – Thumbs up – broccoli/kale

Differentiation and SEND considerations

Support

- The pre-filled column in the What's in My Food? Worksheet ensures all students leave with a completed document.
- During the We do segment, seat supported students with a confident partner.
- Meal Card Ingredients List 1 has the most familiar ingredients to identify.

- The You do segment has sentence starters on the board as a writing scaffold.

Stretch

- Challenge questions during the starter, explaining the connection between iron and vitamin C.
- In the You do segment, a challenge to include further ingredients to match all six nutrients, as well as referring to the seasonality of ingredients.
- Option for a written evaluation as part of the You do section.

