

GCSE (9–1)
Teacher's Guide

FOOD PREPARATION AND NUTRITION

J309
For first teaching in 2016

**Heston Blumenthal's
useful tips and
activities**

Version 1



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Contents

Section A: Nutrition Page 3

Section B: Food provenance and food choice Page 4

Section C: Cooking and food preparation Page 6

Section D: Skills requirements Page 7



SECTION A: NUTRITION

Intro

Whether it's a plate of caviar or a bag of chips, food is – ultimately – fuel. It's what keeps us alive and gives us energy. (A number of scientists now argue that the fact we discovered fire, allowing us to cook a wide range of foods and extend our diet, is what made our brains develop and led to our becoming the dominant species on the planet. It's good grub that made us the top dogs!) It's important, therefore, for a cook to have a good understanding of nutrition, food-health and dietary requirement. Good cooking is, to a great extent, about *balance*, so knowing what makes up a healthy and satisfying plate is invaluable. Some of the topics in this section, such as proteins and carbohydrate, might at first seem like they belong more in a chemistry lesson than a cookery course. But these are the keys to how ingredients behave. And if you know how they work, cooking them will be an easier business – and the opportunities for maximising flavour (which is what all us cooks are after, aren't we?) and being creative will be far greater.

Tips

Topic 7: Carbohydrates (Types and functions)

Carbohydrates can cook very differently, depending on their structure. Starch is a carbohydrate found in rice. Get the kids to cook a batch of long-grain rice alongside a batch of glutinous rice to compare and contrast the results.

Ask the kids what they'd call each type of rice. If somebody calls the glutinous one "sticky" rice then they're exactly right, for that's its other name.

The explanation is that starch contains 2 types of molecule: amylose (which forms itself into orderly patterns) and amylopectin (which is less well-organised). Long-grain rice has about 25% amylose, whereas as sticky rice is almost all amylopectin.



SECTION B: FOOD PROVENANCE AND FOOD CHOICE

Intro

Did you know that if a pig is treated well and humanely during its life, it actually tastes better? (A stressed porker uses up its energy source, glycogen, so there's none left to soften the meat.) Where food comes from and how it's cultivated can make a huge difference to our health, our enjoyment of food and our sense of morality. It's the key to how we maintain the planet's larder while trying to feed an ever-increasing number of mouths. Those are BIG concerns that are the responsibility of all of us, but there are other, smaller reasons why food provenance and choice is important. I spend a lot of my time on the hunt for the best possible ingredients, nurtured in the most caring way, because they make the most delicious food. Knowledge is power – and knowing what makes a great ingredient is without doubt one of the foundation stones of good cooking.

Tips

Topic 11: Food source and supply (advantages and disadvantages of locally produced and seasonal foods)

Between September and March, encourage children, when next in the supermarket, to find out and note if there are fresh strawberries, broad beans or asparagus from the UK. And, if not, to note whether they're available from another country and, if so, which one.

Chances are they won't find any UK examples. Ask them why they think this is. All three are considered British delicacies but have a limited season: broad beans (April-Sept), asparagus (late April to late June), strawberries (May-July). Outside the season, you can't get them.

Now of course, refrigeration and international transport mean we can get them from elsewhere. (Though do they have that same wonderful freshness?) For a child 200 years ago, however, once they were gone, they were gone.

Topic 12: Food Security (Carbon Footprint and the transportation of materials and goods)

"Whose food has come the furthest?"

Get kids to choose a number of favourite ingredients (or the ingredients that go into their favourite meal) and then find out (via supermarket or internet) what country they have come from, or which country is the biggest supplier to the UK.

The results could be charted on a map, with dozens of lines from all over the world converging on the UK, giving a clear visual impression of how global is our food carbon footprint.

Topic 13: Technological Developments to Support Better Health and Food Production (Preservatives, colourings, flavourings and sweeteners, emulsifiers and stabilisers and thickeners)

An emulsion is the combination of two liquids that are normally reluctant to mix together, by using an emulsifier. One of the best emulsifiers is egg yolk (1 yolk can emulsify 2kg of oil!) and one of the best demonstrations of this is making mayonnaise, which if done successfully transforms a set of runny ingredients into something rich, firm and voluminous! So get the kids to have a go. (It's a skill every cook needs, after all.)

The key is to administer the oil extremely slowly. (During emulsification the yolk acts almost like a glue, binding together the oil and water. But if it's asked to "glue" too much oil all at once it can't cope.) Drop by drop at first, then in a slow trickle after it has thickened a bit. If it comes out right, children will witness first-hand the magic of the emulsifier – and they'll taste how different real mayo is compared to the shop-bought stuff.

Topic 15: Food Choice: Sensory Perception and Preference Testing (The importance of the senses of sight, taste, touch, smell and hearing and how they work when making food choices)

Can sound affect flavour?

Each of the senses has a far greater influence on our perception of flavour and enjoyment of food than you realise. Try this little experiment (which was one of the starting points for an actual Fat Duck dish: "Sound of the Sea").

Take some form of seafood or fish, cooked as simply as possible, and cut it in two equal pieces. Give the first piece to someone and let them eat it while listening to sounds of the farmyard (YouTube has examples) and then rate the experience, on a scale of 1-10, for pleasantness, and also for intensity of flavour. Then give the second piece and repeat the experiment but with sounds of the sea (again available on YouTube) in place of the farmyard. When we tried it with oysters, people definitely thought the seascape accompaniment actually enhanced the flavour – proof that more than just our mouths is involved in flavour perception.

Topic 15: Food Choice: Sensory Perception and Preference Testing (The 5 basic tastes recognised by receptors)

Flavour = taste plus aroma.

Choose a biscuit. Pinch your nose, take a bite and chew, keeping the nose pinched. What do you taste? Saltiness or sweetness, probably, but that's about all. Now take another bite, chew and unpinch your nose – a whole wealth of flavours suddenly appear!

This is because the tongue has receptors for the 5 tastes. But flavour comes not just from taste but from smell as well. And that is detected by receptors up behind the nose. (The olfactory bulb.) It's the two senses together – taste and smell – that provide what we call flavour. (That's also why, when we've got a cold, food often seems flavourless. The nose is blocked so we're not detecting all those fragrant smells.)

Topic 15: Food Choice: Sensory Perception and Preference Testing (The 5 basic tastes recognised by receptors)

Puree two contrasting ingredients to the same consistency and put each in a bowl (apple and onion work well).

Blindfold children and get them to pinch their nose, taste each one and try to identify it. Then get them to unpinch and try again.

With the nose pinched, going on taste alone, it's almost impossible – even professional tasters can't get it right! It's a clear indication of (a) what we can actually detect in the mouth and (b) how limited, unexciting and uninformative that is without the sense of smell accompanying it.

Topic 15: Food Choice: Sensory Perception and Preference Testing (The 5 basic tastes recognised by receptors)

Getting to Know the 5 Tastes

The 5 tastes – salty, sweet, sour, bitter and umami – are one of the bedrocks of cooking and very important for the balance and seasoning of a dish, so it's important to get a handle on what each of those tastes is like. Here's a little familiarisation exercise.

Obtain (via internet or Chinese/Japanese foodstores for less common) and put a little in separate bowls of the following five powders, each of which typifies a particular taste:

Salt (salt)

Sugar (sweet)

Bicarbonate of soda (bitter)

Yoghurt powder (sour)

MSG powder (umami)

Get children to try a little of each and endeavour to identify which taste it is. Some are easier than others!

Topic 15: Food Choice: Sensory Perception and Preference Testing (The 5 basic tastes recognised by receptors)

Recognising Umami.

Get kids to taste a variety of ingredients from this group – parmesan, fresh tomato, olives, soy sauce, fish sauce, anchovies, Marmite, ketchup – and try to see if they think there's anything taste-wise they have in common.

These are all products rich in umami – the fifth taste, only identified in Japan in 1908 (long after the other four: salty, sweet, sour, bitter). It's described as a brothy, savoury taste. And when you combine a number of umami-rich ingredients together (like in a classic pizza) you get a real intensity of taste – which is a useful thing to know, as a cook.

SECTION C: COOKING AND FOOD PREPARATION

Intro

There's a temptation, naturally, to just get in the kitchen and learn on the job. But knowing why you're doing what you're doing and how it works will give you much greater confidence and freedom once you're among the pots and pans. One of the reasons I taught myself to cook (rather than doing an apprenticeship) was because I wanted understand the background to what I was doing rather than just blindly following a set of instructions. As a cook, the more you know, the more versatile you are – not just in terms of practical tasks but also in terms of flexible thinking. If you want to be able to cook the perfect piece of pork belly, slow-braised to totally tender delicious over 18 hours, then you need to know technicalities required to achieve that – and also the hygiene issues to be aware of. It'll be worth it!

Tips

Topic 17: Scientific Principles Underlying the Preparation and Cooking of Food (Heat transfer through cooking methods)

Cooking is about heat transfer, but the medium in which that transfer takes place can make a big difference – one the cook can exploit to his or her advantage.

Get kids to bring a pan of water to the boil (100C) and set the oven's dial to 100C. Once both are ready, place some green beans in the pan, and an equal amount of green beans in an oven-proof dish in the oven. When the beans in the pan are ready, remove both batches and see what state the oven-cooked beans are in. They will likely be very undercooked and still fairly firm. This is because air is a much poorer conductor of heat than water is. Which is not that great if you're trying to cook green beans, but perfect if you to finish off the cooking of a fish fillet with a gentle heat.

Topic 18: Sensory and Nutritional Properties (Changes that happen when food is cooked)

Take a pea purée (or similar thick liquid) and divide it into three. Leave one cold, heat the second to tepid and the third until quite hot. Taste all three and you'll see that each one has slightly different characteristics.



SECTION D: SKILLS REQUIREMENTS

Intro

After I'd decided to try and become a chef (I was first inspired at 16 during a trip to a restaurant in France with my parents), I cooked dishes over and over and over again, trying to get them right, then get them better. Written down like that it sounds like a chore, but it was a pleasure. Quickly and neatly chopping veg to a precise size; rolling superfine pastry; creating a shimmeringly crystal-clear stock – this physical graft is part of the fun and rhythm of the kitchen. This is the end result of all you've learned (all that prep and theory): it all channels into producing a fine-looking, fine-tasting plate of food. And there are few pleasures greater than that – both for the cook, and for those who get to eat it. So what are you waiting for, roll up those sleeves and get in the kitchen.

Tips

Seasoning

We have to be careful about salt, but it's also an essential part of seasoning and thereby enhancing the flavour of food, so it's good to have an idea of its effect and how much might be needed.

Take a soup that's ready but as yet unseasoned and pour some into a cup. Add a teaspoon of salt and taste to see how much flavour comes through. Add another teaspoon and taste again, noting meanwhile how many spoons you're adding. And so on.

Gradually, the flavour will build, showing clearly the impact salt can have on a dish. At some point, however, it'll become too salty. If you look at the note of how many spoonfuls it took, you'll have some idea of the amount of salt needed for good seasoning.

Beurre Noisette and Using the Senses to Help Your Cooking

Put 100g of butter in a small pan on a medium heat. Let it bubble and start to turn brown, listening carefully for the moment when the sizzling noise dies down. That sound tells you the butter is ready, so skim off any foam on the surface and strain the butter through a fine sieve or tea strainer into a bowl. Beurre noisette – or nutty butter – is a classic French technique that can be added to all sorts of dishes: it's great with scrambled eggs, for example. It's also a great example of how not just sight, taste and touch but all of the senses – sound, smell – can help the cook and should be used. Keep your ears open and you can make nutty butter while getting on with something else at the same time.



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