

Cambridge TECHNICALS LEVEL 3

APPLIED SCIENCE

Unit 7 – Human nutrition
DELIVERY GUIDE

Version 2

Cambridge
TECHNICALS
2016

2

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INTRODUCTION

This Delivery Guide has been developed to provide practitioners with a variety of creative and practical ideas to support the delivery of this qualification. The Guide is a collection of lesson ideas with associated activities, which you may find helpful as you plan your lessons.

OCR has collaborated with current practitioners to ensure that the ideas put forward in this Delivery Guide are practical, realistic and dynamic. The Guide is structured by learning outcome so you can see how each activity helps you cover the requirements of this unit.

We appreciate that practitioners are knowledgeable in relation to what works for them and their learners. Therefore, the resources we have produced should not restrict or impact on practitioners' creativity to deliver excellent learning opportunities.

Whether you are an experienced practitioner or new to the sector, we hope you find something in this guide which will help you to deliver excellent learning opportunities.

If you have any feedback on this Delivery Guide or suggestions for other resources you would like OCR to develop, please email resources.feedback@ocr.org.uk.

OPPORTUNITIES FOR ENGLISH AND MATHS SKILLS DEVELOPMENT AND WORK EXPERIENCE

We believe that being able to make good progress in English and maths is essential to learners in both of these contexts and on a range of learning programmes. To help you enable your learners to progress in these subjects, we have signposted opportunities for English and maths skills practice within this resource. We've also identified any potential work experience opportunities within the activities. These suggestions are for guidance only. They are not designed to replace your own subject knowledge and expertise in deciding what is most appropriate for your learners.



English



Maths



Work

Please note

The activities suggested in this Delivery Guide **MUST NOT** be used for assessment purposes. The timings for the suggested activities in this Delivery Guide **DO NOT** relate to the Guided Learning Hours (GLHs) for each unit.

Assessment guidance can be found within the Unit document available from www.ocr.org.uk. The latest version of this Delivery Guide can be downloaded from the OCR website.

UNIT AIM

The human body requires a range of nutrients to ensure sufficient bodily function and health. The aim of this unit is to provide you with knowledge of the nutrients needed and the way the body uses them.

You will be able to calculate the energy content of food and compare with requirements. You will also understand the importance of hydration and supplements. Finally the unit links the development of deficiency and disease from a biological and psychological perspective.

Unit 7 Human nutrition

LO1	Understand human nutritional requirements in the maintenance of health
LO2	Be able to calculate nutritional requirements to maintain energy for different levels of activity
LO3	Understand conditions relating to dietary needs
LO4	Be able to label food with nutritional information

To find out more about this qualification, go to: <http://www.ocr.org.uk/qualifications/vocational-education-and-skills/cambridge-technicals-applied-science-level-3-certificate-extended-certificate-foundation-diploma-diploma-extended-diploma-05847-05849-05879-05874-2016-suite/>

Cambridge
TECHNICALS
2016

2016 Suite

- New suite for first teaching September 2016
- Externally assessed content
- Eligible for Key Stage 5 performance points from 2018
- Designed to meet the DfE technical guidance

RELATED ACTIVITIES

The Suggested Activities in this Delivery Guide listed below have also been related to other Cambridge Technicals in Applied Science units/Learning Outcomes (LOs). This could help with delivery planning and enable learners to cover multiple parts of units.

This unit (Unit 7)	Title of suggested activity	Other units/LOs	
LO1	Food tests	Unit 17 Food technology	LO4 Be able to test product samples
	Testing for vitamin C		
	Food diary	Unit 17 Food technology	LO1 Understand the main features of food manufacturing operations
LO3	Golden rice	Unit 8 Cell biology	LO3 Understand the cell cycle and the importance of mitosis

KEY TERMS

Explanations of the key terms used within this unit, in the context of this unit

Key term	Explanation
Allergen	A type of antigen that causes an immune response called an allergic reaction.
Allergy	A reaction that the body has to food or a substance.
Amino acids	These are building blocks of proteins.
Anaphylactic shock	A serious allergic reaction that can result in death.
Anorexia nervosa	An eating disorder in which an individual keeps their body weight as low as possible.
Antigen	A substance that causes the immune system to produce antibodies against it.
Atherosclerosis	A condition where arteries become clogged up by fatty substances known as plaques or atheroma.
Bacteria	These are small living microorganisms.
Biochemical	Relating to the chemical composition of a biological substance.
BMR	Basal metabolic rate: minimum rate of energy expenditure per unit of time by a body at rest.
British Nutrition Foundation	A registered charity that provides impartial evidence-based information on food and nutrition.
Bulimia	A mental health and eating disorder. Individuals binge eat and often use laxatives or forced vomiting to get rid of excess food.
Calorimeter	An instrument for measuring the heat of chemical reactions.
Campylobacter	A foodborne bacterial disease.
Cell membrane	This separates the interior of individual cells from their environment.
Cholesterol	A lipid molecule synthesised by animal cells.
Dementia	A brain disorder that causes a decrease in the ability to think.
Department of Health	The UK government department responsible for the policy on health.
Diabetes	A metabolic disease in which the body has a high level of glucose.
Diuretic	A substance that promotes the production of urine.
Diverticular disease	This is a digestive disease affecting the large intestine.
E. coli 0157	Bacterium that lives in the gut of animals; the toxins it produces are harmful to humans.
Electrolytes	Substances that produce electrical conducting solutions when dissolved in fluid (for example water or blood plasma).
Enzymes	These catalyse (speed up) chemical reactions.
Essential proteins	That which the body cannot produce itself.
Folic acid	A B vitamin, synthetically produced; can be found in some foods and supplements.
Food Standards Agency	Responsible for protecting public health in relation to food.
Glucose	A type of sugar.
Histamine	Part of the body's immune system and regulates physiological function in the gut.

Explanations of the key terms used within this unit, in the context of this unit

Key term	Explanation
Immunological response	A process that protects the body against disease and substances that can cause it harm.
Lactose intolerance	This is when the body cannot easily digest lactose.
Lipoprotein	A biochemical of proteins and lipids.
Listeria	A type of bacteria from contaminated food.
Malnutrition	A condition resulting from not eating enough and/or not getting the required nutrients.
Metabolise	The breaking down of substances and their reorganisation to form others.
Miscarriage	A natural death of an embryo or foetus.
Myelin	This is a fatty substance which forms a sheath around the axon of some nerves.
Neurotransmitters	Chemicals that transmit signals between nerve cells.
NHS Choices	An NHS website with information and advice on health.
Nitrogen	A chemical element found in all proteins.
Non-essential protein	That which the body can produce itself.
Novovirus	A virus causing nausea, vomiting and diarrhoea, passed on through contaminated food and water.
Nucleic acid	A group of complex polymers found in living cells.
Nucleoprotein	A compound made up of a nucleic acid and a simple protein.
Osteoporosis	A condition where bone become brittle, normally as a result of lack of vitamin D, lack of calcium or hormonal issues.
Phosphoprotein	A protein modified by the attachment of at least one phosphate group.
Phosphoric acid	A mineral acid.
Preservative	Substance added to, or a procedure to lengthen the shelf life of, food.
Protein synthesis	How individual cells construct proteins.
Resting energy expenditures (REE)	The energy that the resting body uses to maintain the bodily functions.
Scientific Advisory Committee on Nutrition (SACN)	A committee that advises the government on nutrition and related public health issues.
Stillbirth	Is defined as foetal death after 20 weeks of gestation.
Thyroid	The thyroid gland controls the rate of use of energy and protein synthesis.
Urea	A chemical compound produced during metabolism.

MISCONCEPTIONS

Some common misconceptions and guidance on how they could be overcome		
What is the misconception?	How can this be overcome?	Resources which could help
Vegetarian diets are always healthier	Vegetarians do not eat meat and other animal based foods, so they do consume lower levels of fat in total and very low levels of saturated fats (consuming saturated can lead to health problems). However, a vegetarian who eats lots of cheese and eggs is still consuming substantial amounts of fats would actually have a less healthy diet than someone whose diet is based on fish and chicken.	<p>10 interesting vegetarian facts Health24 http://www.health24.com/Diet-and-nutrition/Healthy-diets/10-interesting-vegetarian-facts-20120721 An interesting myth-busting article.</p> <p>Key vegetarian facts The Vegetarian Society of the United Kingdom https://www.vegsoc.org/sslpage.aspx?pid=599 The website of the Vegetarian Society.</p> <p>Vegetarianism: The Basic Facts Academy of Nutrition and Dietetics http://www.eatright.org/resource/food/nutrition/vegetarian-and-special-diets/vegetarianism-the-basic-facts Great resource for healthy eating.</p>
Healthy eating is too expensive	To eat healthily is seen as costly and the preserve of the financially better off. However, planning meals and carefully selecting foods when shopping can lead to an economic and healthy diet.	<p>'Healthy foods expensive' claim is unrealistic NHS Choices http://www.nhs.uk/news/2014/10October/Pages/Healthy-food-costs-you-more-claim.aspx Balanced account of how a healthy diet is easily accessed.</p> <p>Food Access United States Department of Agriculture, Economic Research Service http://www.ers.usda.gov/topics/food-choices-health/food-access/ A perspective from the USA.</p>
Basal metabolic rate (BMR) varies at different times of day and is affected by different foods	BMR is a constant factor that is the sum of all the chemical reactions in a body at rest (hence basal). Metabolic rate is increased with activity such as exercise. Increasing metabolic rate by exercising would lead to weight loss if energy intake is not increased.	<p>Ten weight loss myths; Get active your way NHS Choices http://www.nhs.uk/Livewell/loseweight/Pages/Weightlossmyths.aspx http://www.nhs.uk/Livewell/fitness/Pages/activelifestyle.aspx NHS web pages on metabolism.</p>
Carbohydrates are fattening	As part of a balanced diet carbohydrates are not fattening. It is usually how they are cooked (i.e. fried) or what is added (fatty mayonnaise or butter) that can be energy dense. Only an excessive intake of starch can lead to weight gain. Dietary fibre, which is an essential part of a diet, is also a carbohydrate, being based on the polysaccharide cellulose.	<p>Ten weight loss myths; Starchy foods and carbohydrates NHS Choices http://www.nhs.uk/Livewell/loseweight/Pages/Weightlossmyths.aspx http://www.nhs.uk/Livewell/Goodfood/Pages/starchy-foods.aspx NHS web pages on weight loss.</p>

Some common misconceptions and guidance on how they could be overcome		
What is the misconception?	How can this be overcome?	Resources which could help
BMI values are reliable as a measure of obesity	BMI values should only be used as a rough guide to determine if a person is over- (or under-) weight. Skin folds, direct body measurements, and other factors should also be used	<p>Adds et al (1998) <i>NAMS Food and Health</i>, Nelson https://www.amazon.co.uk/NAMS-Food-Health-John-Adds/dp/0174482728 This is an old textbook but is still available from outlets such as Amazon.</p> <p>BMI healthy weight calculator NHS Choices http://www.nhs.uk/Tools/Pages/Healthyweightcalculator.aspx NHS BMI calculator.</p> <p>Why BMI is inaccurate and misleading Medical News Today http://www.medicalnewstoday.com/articles/265215.php Good account of why BMI alone is unreliable.</p>
Sugars in foods are less dangerous than fats	Many popular foods such as yogurts, pizzas and cereals may be low fat but are packed with sugars. There is much evidence that cutting sugar intake will lead to weight loss, but these supposedly healthy foods may actually have the reverse effect.	<p>Acred, C. (ed) (2014) <i>Food and Diet in the UK</i>, Volume 271, Independence Educational Publishers http://www.independence.co.uk/shop/health-and-wellbeing/issues/food-and-diet-in-the-uk Explores concerns surrounding food and diet, with material from the media, government and charity groups to provide different perspectives.</p> <p>Sugar: spinning a web of influence British Medical Journal http://www.bmj.com/content/350/bmj.h231 Article about the food industry.</p> <p>How much sugar is hidden in drinks marketed to children? A survey of fruit juices, juice drinks and smoothies BMJ Open http://bmjopen.bmj.com/content/6/3/e010330.abstract Article about sugars in food.</p>

Some common misconceptions and guidance on how they could be overcome		
What is the misconception?	How can this be overcome?	Resources which could help
Salt in foods is a hidden killer	Salt is an essential flavouring and preservative in foods. High salt intake is, however, linked to high levels of stroke and hypertension (a major factor in heart disease). Reduction in salt intake would reduce the risks of both of these conditions.	<p>Acred, C. (ed) (2014) <i>Food and Diet in the UK</i>, Volume 271, Independence Educational Publishers http://www.independence.co.uk/shop/health-and-wellbeing/issues/food-and-diet-in-the-uk Explores concerns surrounding food and diet, with material from the media, government and charity groups to provide different perspectives.</p> <p>Effect of lower sodium intake on health: systematic review and meta-analyses British Medical Journal http://www.bmj.com/content/346/bmj.f1326 Learned article about salt reduction; read the conclusion.</p> <p>Reducing salt and increasing potassium will have major global health benefits British Medical Journal http://www.bmj.com/press-releases/2013/04/04/reducing-salt-and-increasing-potassium-will-have-major-global-health-benef Article about salt in a global context.</p>
Eating disorders are a minor problem	Because patients are predominantly teenagers these disorders can be underestimated in their impact and the level of suffering they cause.	<p>Karen Carnabucci and Linda Ciotola (2013) <i>Healing Eating Disorders with Psychodrama and Other Action Methods</i>, Jessica Kingsley Publishers</p> <p>Open Mind Presentation: Everything You Wanted to Know About Eating Disorders but Were Afraid to Ask Acadia Hospital https://www.youtube.com/watch?v=stkm8YpJTol Presentation by an eating disorders consultant and nutritional consultant.</p>
Allergies are a fad	People have always suffered from allergic reactions, to things such as bee stings, scratches and pollen. However, it is apparent that food allergies are a recent development and appear to be prevalent in relatively privileged and well off individuals. This is a myth; most of these allergies have developed as a result of diets containing more processed foods, exposure to fewer antigens and other environmental threats (i.e. dirt).	<p>Food Allergy or Food Intolerance? Allergy UK https://www.allergyuk.org/food-allergy-or-food-intolerance/food-allergy-or-food-intolerance?gclid=CPKsnvXipM4CFe4K0wodf_8OYw Authoritative article from Allergy UK.</p> <p>Food allergy NHS Choices http://www.nhs.uk/conditions/food-allergy/Pages/Intro1.aspx NHS perspective on allergies.</p>

Some common misconceptions and guidance on how they could be overcome		
What is the misconception?	How can this be overcome?	Resources which could help
Pregnant women need to 'eat for two'	Literally doubling your calorific energy intake would cause weight gain, even for a pregnant individual. Pregnancy requires an increase in intake of energy and other essential nutrients, but only about 10-20% more.	<p>Acred, C. (ed) (2014) <i>Food and Diet in the UK</i>, Volume 271, Independence Educational Publishers http://www.independence.co.uk/shop/health-and-wellbeing/issues/food-and-diet-in-the-uk Explores concerns surrounding food and diet, with material from the media, government and charity groups to provide different perspectives.</p> <p>Pregnancy and pre-conception British Nutrition Foundation https://www.nutrition.org.uk/nutritionscience/life/pregnancy-and-pre-conception.html Nutritional tips for pregnant women.</p>
Pregnant women can eat anything they like	The key to pregnancy is to eat healthily and a range of foods. There are also essential supplements such as folic acid and calcium as well as foods to avoid such as soft cheese and liver.	<p>Foods to avoid in pregnancy; Vitamins, supplements and nutrition in pregnancy NHS Choices http://www.nhs.uk/Conditions/pregnancy-and-baby/pages/foods-to-avoid-pregnant.aspx http://www.nhs.uk/Conditions/pregnancy-and-baby/pages/vitamins-minerals-supplements-pregnant.aspx NHS advice for pregnancy.</p>

Some common misconceptions and guidance on how they could be overcome		
What is the misconception?	How can this be overcome?	Resources which could help
Sweeteners are harmful	Sweeteners are low calorie or calorie free alternatives to sugars, added to foods to make them palatable but not fattening. They are also important in preventing tooth decay, which is closely associated with sugar intake. All sweeteners undergo rigorous scientific testing to ensure their safety and most evidence suggests they are not linked to health problems such as cancer.	<p>Acred, C. (ed) (2014) <i>Food and Diet in the UK</i>, Volume 271, Independence Educational Publishers http://www.independence.co.uk/shop/health-and-wellbeing/issues/food-and-diet-in-the-uk Explores concerns surrounding food and diet, with material from the media, government and charity groups to provide different perspectives.</p> <p>Consumption of sugar sweetened beverages, artificially sweetened beverages, and fruit juice and incidence of type 2 diabetes: systematic review, meta-analysis, and estimation of population attributable fraction British Medical Journal http://www.bmj.com/content/351/bmj.h3576 Article on sweeteners.</p> <p>Sweeteners EFSA (European Food Safety Authority) https://www.efsa.europa.eu/en/topics/topic/sweeteners EFSA's ANS Panel carries out risk assessments and provides scientific advice on food additives used as sweeteners.</p> <p>Food controversies Cancer Research UK http://www.cancerresearchuk.org/about-cancer/causes-of-cancer/diet-and-cancer/food-controversies An authoritative account from Cancer Research UK.</p>
Foods labelled low fat are always the healthy choice	Check the label and ensure the food is not full of sugar.	<p>Ten weight loss myths; Fat: the facts NHS Choices http://www.nhs.uk/Livewell/loseweight/Pages/Weightlossmyths.aspx http://www.nhs.uk/Livewell/Goodfood/Pages/Fat.aspx NHS advice on food labels.</p>

Some common misconceptions and guidance on how they could be overcome		
What is the misconception?	How can this be overcome?	Resources which could help
Food additives are all bad	All food additives are rigorously tested out to ensure safety and are given European 'E' prefixes; hence E numbers.	<p>Food Additives EFSA (European Food Safety Authority) https://www.efsa.europa.eu/en/topics/topic/additives Information from European Union agency.</p> <p>Current EU approved additives and their E Numbers Food Standards Agency https://www.food.gov.uk/science/additives/enumberlist Information from UK government agency.</p> <p>E-Numbers Food Additives & Ingredients Association http://www.faia.org.uk/e-numbers/ Information from UK Industry body.</p>
Foods produced from biotechnology are bad	Humans have used biotechnology for thousands of years; bread, yogurt, beer and honey are all biotechnological products. Biotechnology is simply obtaining a commercial product from a living thing. The name conjures up ideas of genetic modification of crops or growing monstrous 'germs' in tanks. To debunk this learners could investigate the manufacture of foods such as Quorn.	<p>Adds et al (1998) <i>NAMS Food and Health</i>, Nelson https://www.amazon.co.uk/NAMS-Food-Health-John-Adds/dp/0174482728</p> <p>Background on Food Biotechnology Food Insight http://www.foodinsight.org/Background_on_Food_Biotechnology This is an excellent overview.</p> <p>National Centre for Biotechnology Education University of Reading http://www.ncbe.reading.ac.uk The NCBE has some good resources.</p> <p>Modern Biotechnology in Food: What is food biotechnology? European Food Information Council (EUFIC) http://www.eufic.org/article/en/food-technology/gmos/rid/modern-biotechnology-food-biotechnology/ EUFIC is a non-profit organisation that provides science-based information on nutrition and health, and food safety and quality.</p> <p>Quorn homepage http://www.quorn.co.uk Quorn products are made from Mycoprotein™, a meat-free protein source.</p>

Some common misconceptions and guidance on how they could be overcome		
What is the misconception?	How can this be overcome?	Resources which could help
Food preservation reduces the nutritional benefits of foods	It depends on the method; refrigeration is short-term and freezing long-term, with little decline in nutritional value. Canning foods involves exposure to heat and pressure and affects taste and appearance, as well as reducing some sensitive nutrients such as vitamins.	<p>Adds et al (1998) <i>NAMS Food and Health</i>, Nelson https://www.amazon.co.uk/NAMS-Food-Health-John-Adds/dp/0174482728</p> <p>What nutrients are lost or destroyed by freezing? World's Healthiest Foods http://www.whfoods.com/genpage.php?tname=george&dbid=215 Good article on freezing.</p> <p>How Cooking Affects The Nutrient Content of Foods Authority Nutrition https://authoritynutrition.com/cooking-nutrient-content/ Article on the effects of heat treatment.</p>

SUGGESTED ACTIVITIES

LO No:	1		
LO Title:	Understand human nutritional requirements in the maintenance of health		
Title of suggested activity	Suggested activities	Suggested timings	Also related to
Food tests	<p>A practical investigation of chemical components of food items.</p> <p>Learners could:</p> <ul style="list-style-type: none"> perform standard biochemical tests for the presence of protein (biuret test), starch (iodine), reducing sugars such as glucose (Benedict's test) and lipids (alcohol emulsion) carry out the standard tests on known substances then on a range of common foods. <p>A comparison of foods in a table in a lab report would give learners a record of their experiment.</p> <p> An interesting development of this the 'Gotcha-Geroff' (see link below). Two samples of artificial stomach contents from fictitious animals (one carnivore, and one herbivore) are compared. The stomach samples are easy to make up and analyse.</p> <p> Law, R. (1995) An A-level food test investigation. <i>Journal of Biological Education</i> 29(4) http://www.tandfonline.com/doi/abs/10.1080/00219266.1995.9655457?journalCode=rjbe20</p>	1–2 hours	Unit 17 LO4
Testing for vitamin C	<p>Learners could investigate the levels of vitamin C in fruit juice using DCPIP, a simple colorimetric test. DCPIP changes colour from dark blue to colourless in the presence of reducing agents such as vitamin C. The test can be made semi-quantitative with the volume of DCPIP added to decolourise being proportional to vitamin C concentration.</p> <p> A development of this practical could be to compare different juices or to investigate how storage time/conditions (such as temperature) affects vitamin C content.</p> <p> Learners could write this as a lab report with appropriate graphs such as a bar chart of vitamin C content from different sources or a line graph showing changes over time or against temperature.</p>	1–2 hours	Unit 17 LO4
Balanced diet food card sort	<p>Learners are introduced to the idea of a balanced diet by a simple card sort and word matching activity. There are three groups of cards. The seven main nutrient groups are written on one set of cards. A second set of cards have a function of a nutrient written on them and a third group a food source. Learners match the nutrient to function and source to produce three lists, which can be organised. Digital photographs could be taken as a record for healthy eating activity (see next suggested activity).</p>	<1 hour	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Healthy eating 	<p>Learners can produce a poster of what a balanced diet should consist of.</p> <p>This is a good information source (there are many others):</p> <p>The Dairy Council http://www.milk.co.uk/ Provides free booklets on sustainable and healthy eating.</p>	1 hour then finish for homework	
What's in a diet?	<p>Learners are given one diet to research from a list. Suggested diets to use in this activity include:</p> <ul style="list-style-type: none"> • 5:2 diet • Dukan diet • Paleo diet • New Atkins diet • Alkaline diet • Cambridge diet • South Beach diet • Slimming World diet • Slim-Fast diet • LighterLife diet • WeightWatchers diet • Rosemary Conley diet. <p>For example, the Dukan diet has four phases where the person varies their diet according to instruction. The basis is very low fat and digestible carbohydrate content whilst high in protein and fibre. Dukan has a list of '100 allowed foods'.</p> <p>Working individually or in pairs, learners compare their diet with what is considered a conventional balanced diet: one which has all the main food groups including water in the appropriate quantities. They then present this to the class via a PowerPoint presentation, commenting whether their chosen diet is healthy and why.</p> <p>Healthy Eating British Dietetic Association (BDA) https://www.bda.uk.com/foodfacts/HealthyEating.pdf A good fact sheet. Further resources can be found on the BDA's website https://www.bda.uk.com/.</p> <p>Top diets review for 2016 NHS Choices http://www.nhs.uk/Livewell/loseweight/Pages/top-10-most-popular-diets-review.aspx A look at the pros and cons of some of the most popular diets.</p>	1–2 hours	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Food diary	<p>Learners could be guided by tutors to keep a log of their dietary intake for one week, recording <i>all</i> food and drink consumed. They could then estimate the approximate weight of food and volume of drink to calculate how much of each nutrient they have consumed.</p> <p>Tutors could demonstrate examples of what 200g of potatoes and 250 cm³ of juice looks like. Using nutrition tables learners could calculate their intake of major and minor nutrients where possible, plus energy intake. Important examples to consider would be fat, sugars and protein. Learners can then compare their own diet with a conventional healthy diet.</p> <p>They could write a summary report for their tutor (understandable if some would rather not share their findings with other learners).</p> <p>Tables to allow learners to perform these calculations are available from:</p> <p>Food Aid Information System: Food Composition Table World Food Programme http://www.wfp.org/fais/nutritional-reporting/food-composition-table A free downloadable resource.</p> <p> 123 Food Composition Table Pearson https://www.pearsonhighered.com/product/Food-Composition-Table/9780321667939.html A priced resource.</p> <p> ABC</p>	1 week plus 1–2 hours in class	Unit 17 LO1

SUGGESTED ACTIVITIES

LO No:	2		
LO Title:	Be able to calculate nutritional requirements to maintain energy for different levels of activity		
Title of suggested activity	Suggested activities	Suggested timings	Also related to
Energy in foods  	<p>A basic practical to demonstrate how different foods have different levels of energy. Ask learners to compare different foods by this crude method:</p> <ul style="list-style-type: none"> • Take a range of common and easy to handle foods (crisps, biscuits, crackers, nuts [check for allergies], pulses etc) and burn them under a boiling tube containing a known volume of water. • Check the rise in water temperature until the food stops burning. • Perform a simple calculation (volume × temperature change × 4.2) to give energy expenditure in joules. <p>For further details see the following resource::</p> <p>How much energy is there in food? Nuffield Foundation http://www.nuffieldfoundation.org/practical-biology/how-much-energy-there-food Sets out a very good detailed method for the experiment.</p> <p>The experiment could be extended to compare different foods; for example, nuts and crisps with substantial fat content would release more energy than a cereal flake or crispbread, which have more carbohydrate. The energy expenditure can be linked to an ideal healthy balanced diet, i.e. fatty foods contribute lots of energy.</p>	1 hour	
Calorimetric determination of energy content of foods  	<p>A more accurate method of energy determination is obtained by using a bomb calorimeter.</p> <p>Again foods are burnt beneath the fixed volume of water in the calorimeter. Tutors should follow the manufacturer's instructions to fully utilise the calorimeter.</p> <p>Learners could again calculate energy output of foods and produce a lab report with results presented in tables, possibly with the data presented as bar charts.</p>	1–2 hours	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Basal metabolic rate (BMR) calculations	<p>Without a full human calorimeter, accurate BMR values cannot be calculated. Learners could estimate their own BMR based on simple calculations; they need to measure their mass and height then feed the data into a BMR calculator such as:</p> <p>BMR Calculator Diabetes UK http://www.diabetes.co.uk/bmr-calculator.html The result from this calculator is in calories so needs converting to kJ ($\times 4.2$).</p> <p>Learners could compare their value with published data and also to energy requirements. Fullick (1998) has good data:</p> <p> Fullick, A. (1998) <i>Human Health and Disease</i>, Heinemann. https://www.amazon.co.uk/Heinemann-Advanced-Science-Health-Disease/dp/0435570919</p> <p> A comparison with their food diary (one of the suggested activities for Learning Outcome 1) might inform learners if their food intake is in line with BMR or not.</p>	<1 hour	
Exercise effects	<p>A continuation of the work on BMR could be for learners to research the BMR values and energy requirements of different groups of people relating to exercise levels.</p> <p> Learners could write a short information leaflet advising members of one of their college/school sports teams on healthy diet and calorific intake matched to their activity.</p> <p></p>	<1 hour	
Diet and lifestyle	<p>Learners could study a range of case studies of different people. The studies set out an individual's personal situation such as age, gender, background health and lifestyle such as occupation and exercise habits. Great sources of case studies include:</p> <p>Joyce and Albert Wells British Nutrition Foundation http://www.foodfactoflife.org.uk/attachments/88cfb71e-c2d5-44173515cf27.pdf</p> <p>Case Studies Nutritional Research Foundation https://www.nutritionalresearch.org/case-studies</p> <p>Learners could choose an individual and advise them about any risk factors for illness such as diabetes, coronary heart disease (CHD) or obesity for their case study and write a short remedial report in each case with advice on diet and exercise.</p>	1–2 hours	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
<p>What is wrong with the western diet?</p>	<p>Learners could read this article:</p> <p>Britain: 'the fat man of Europe' NHS Choices http://www.nhs.uk/Livewell/loseweight/Pages/statistics-and-causes-of-the-obesity-epidemic-in-the-UK.aspx</p> <p>One in four British adults is obese, according to the UN Food and Agriculture Organisation, prompting fears that the UK has become the 'fat man of Europe'.</p> <p>A question sheet or comprehension exercise could be compiled to test out learners. Example questions can be a direct test of content such as 'How long do UK adults spend on average watching TV?'. Alternatively, tutors could set tasks that develop a learner's understanding such as 'Obesity is linked to deprivation; outline factors that contribute to deprivation'.</p> <p>Risk factors of major diet-related disease should be highlighted to the learners, particularly CHD and type 2 diabetes.</p>	1–2 hours	

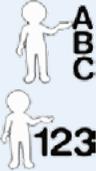


SUGGESTED ACTIVITIES

LO No:	3		
LO Title:	Understand conditions relating to dietary needs		
Title of suggested activity	Suggested activities	Suggested timings	Also related to
Malnutrition	<p>Learners could be given information such as accounts of children suffering with different types of malnutrition such as marasmus or kwashiorkor. Good information on types of malnutrition can be accessed from text books such as</p> <p>Adds et al (1998) <i>NAMS Food and Health</i>, Nelson https://www.amazon.co.uk/NAMS-Food-Health-John-Adds/dp/0174482728</p> <p>The links below provide an explanation of two types of malnutrition:</p> <p>Kwashiorkor NHS Choices http://www.nhs.uk/Conditions/kwashiorkor/Pages/Introduction.aspx</p> <p>What You Should Know About Marasmus Healthline http://www.healthline.com/health/marasmus#Overview1</p> <p>Protein-Energy Malnutrition The Free Dictionary by Farlex http://medical-dictionary.thefreedictionary.com/protein-energy+malnutrition</p> <p>Cases of malnutrition are now being seen in the UK:</p> <p>Malnutrition causing thousands of hospital admissions BBC News http://www.bbc.co.uk/news/uk-england-34777348</p>  <p>Working in groups, learners could link causes and symptoms with the two main forms of malnutrition, kwashiorkor (protein malnutrition) and marasmus (energy malnutrition).</p>	1 hour	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
<p>Nutrient requirements of human life stages</p> 	<p>Human dietary requirements change through a life from the neonate to the elderly. Ask learners to work in small groups to research a given specific stage in a human life cycle which should be provided by the tutor. They should work from a range of sources to summarise nutrient requirements in their chosen stage, highlighting any specific requirements.</p> <p>Good examples would include why the very young and elderly need vitamin D and calcium, why teenagers need the most energy, or the special requirements of a pregnant woman. Data can be collected and tabulated. Suggested life stages would be:</p> <ul style="list-style-type: none"> • neonates • early childhood • teenage • adulthood • pregnancy • old age. <p>Learners can present their research to the group via a PowerPoint presentation or a poster.</p> <p>Nutrition through life British Nutrition Foundation https://www.nutrition.org.uk/nutritionscience/life.html Outlines the science of nutrition through life and how this affects health.</p> <p>Food and your life stages Department of Health & Human Services, State Government of Victoria https://www.betterhealth.vic.gov.au/health/healthyliving/food-and-your-life-stages The topic is well laid out in this website from Australia.</p> <p>What to feed young children; Child health 6–15; Keeping your weight up in later life NHS Choices http://www.nhs.uk/conditions/pregnancy-and-baby/pages/understanding-food-groups.aspx http://www.nhs.uk/livewell/childhealth6-15/Pages/Childhealth615home.aspx http://www.nhs.uk/Livewell/over60s/Pages/Underweightover60.aspx NHS advice for the newborn and younger children, children and teens, and the elderly (including dealing with weight loss), respectively.</p>	1–2 hours	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Food allergies and intolerances exercise	<p>A food allergy is a response from your immune system to substances in foods that are usually harmless. The body is fighting against specific proteins in food.</p> <p>Learners could be given the names of common foods that cause serious allergies, such as egg, peanut, soya, shellfish or wheat (many others can be found). Working in small groups, learners choose one food and research the cause and symptoms of the allergy to their chosen food. Symptoms can include diarrhoea, inflammation of the face and lips, irritation and itchiness. Learners should find out if their particular allergy can be fatal and what anaphylactic shock is.</p> <p>Good research sources include:</p> <p>Food Allergy or Food Intolerance? Allergy UK https://www.allergyuk.org/food-allergy-or-food-intolerance/food-allergy-or-food-intolerance?gclid=CPKsnvXipM4CFe4K0wodf_8OYw</p> <p>Food allergy NHS Choices http://www.nhs.uk/conditions/food-allergy/Pages/Intro1.aspx</p>	1 hour	
Vitamin/mineral deficiency study	<p>Provide learners with a list of vitamins and minerals essential to the diet. Learners will:</p> <ul style="list-style-type: none"> • pick one of each vitamin and mineral and research the deficiency disease, including symptoms, prevalence and treatment • identify good dietary sources of each mineral or vitamin – common examples could include rickets (vitamin D), scurvy (vitamin C), anaemia (iron), hypothyroidism (iodine) but many others exist. 	<1 hour	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
<p>Golden rice</p> 	<p>An investigation of genetic modification of rice with genes from daffodils and microorganisms to boost vitamin A production. Vitamin A deficiency is a major contributory factor in blindness in Africa and Asia. Golden rice can be researched and learners can perform calculations from data available and comment on its viability. Data for this activity can be accessed from:</p> <p>Jones, M. (2008) <i>Biology 2 for OCR</i>, Cambridge University Press https://www.amazon.co.uk/Biology-Student-Cambridge-Advanced-Sciences/dp/0521732999</p> <p>Opinion is divided on the benefits of golden rice. The following two websites present competing sides of the argument:</p> <p>Golden Rice is part of the solution Golden Rice Project http://www.goldenrice.org The organisation behind the golden rice initiative.</p> <p>Golden Rice Greenpeace http://www.greenpeace.org/international/en/campaigns/agriculture/problem/Greenpeace-and-Golden-Rice/ Greenpeace opposes the release of genetically engineered crops, including golden rice, into the environment.</p>	1 hour	Unit 8 LO3
<p>Eating disorders</p>	<p>This can be a taboo subject and needs dealing with sensitively. Case studies and timelines of sufferers from anorexia and bulimia would be a good way to expose learners to this topic. Learners could summarise risk factors related to eating disorders and give an account of the development and treatment of cases.</p> <p>Karen Carnabucci and Linda Ciotola (2013) <i>Healing Eating Disorders with Psychodrama and Other Action Methods</i>, Jessica Kingsley Publishers https://books.google.co.uk/books/about/Healing_Eating_Disorders_with_Psychodram.html?id=neldj6mIE4wC&redir_esc=y A good source for information. This book is full of personal accounts that can be easily summarised, with risk factors and how to deal with them.</p> <p>Open Mind Presentation: Everything You Wanted to Know About Eating Disorders but Were Afraid to Ask Acadia Hospital https://www.youtube.com/watch?v=stkm8YpJTol Presentation by an eating disorders consultant and a nutritional consultant.</p>	1 hour in class time then homework	

SUGGESTED ACTIVITIES

LO No:	4		
LO Title:	Be able to label food with nutritional information		
Title of suggested activity	Suggested activities	Suggested timings	Also related to
Food label survey	<p>Learners could bring in examples of food labels and then undertake a group exercise where learners put the food labels into groups according to the main food groups they will have learnt about for Learning Outcome 1. Within each food group they should list the main components including energy and indicate any minerals or vitamins highlighted. Each group could then produce a poster or a PowerPoint presentation to feed back their findings to the group.</p> <p>Acred, C. (ed) (2014) <i>Food and Diet in the UK</i>, Volume 271, Independence Education Publishers http://www.independence.co.uk/shop/health-and-wellbeing/issues/food-and-diet-in-the-uk A good guide for this activity.</p>	1–2 hours	
Making your own food labels	<p>Learners build on the previous suggested activity by designing a label of their own for a chosen food or drink. Good examples might be energy drinks, yogurts, biscuits or snacks such as crisps. There would be scope for computer-based design on an appropriate platform.</p> <p>Key tips for great food label design for food and drink products Toast Design https://www.toastdesign.co.uk/food-label-design/ A good website to stimulate ideas.</p> <p>What are 'reference intakes' on food labels? NHS Choices http://www.nhs.uk/Livewell/Goodfood/Pages/reference-intakes-RI-guideline-daily-amounts-GDA.aspx This NHS web page could also be helpful.</p>	2 hours	
Nutritional value recipe: turn a favourite into a ready meal 	<p>Learners could be tasked with turning a favourite dish into a ready meal for a supermarket. They will:</p> <ul style="list-style-type: none"> • provide a favourite recipe (one of their own or their families, or one from a cookbook) • make and share their dish if facilities are available in the centre (care with health and safety) • break down the nutritional components, and calculate the energy content and how much of each of the other essential nutrients are present in a similar way to that done with their food diaries • design packaging with pictures along with approved labelling (with reference to legal requirements) to indicate the nutritional content. 	3–4 hours	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Legislation exercise	<p>Learners could research and write a report on current food labelling law in the UK and EU.</p> <p>Food labelling and packaging Gov.uk https://www.gov.uk/food-labelling-and-packaging/overview This is a good place to start research.</p> <p>Labelling Matters Soil Association https://www.soilassociation.org/our-campaigns/labelling-matters/ The Soil Association campaigns to provide transparent information on food to consumers.</p>	1–2 hours	
Special labels exercise	<p>Learners could highlight special examples such as if the food is organic, Fairtrade or irradiated. Other examples of food labels to research would be suitability for special dietary need such as gluten-free, vegan or lactose intolerance.</p> <p>This activity could be expanded to include research into allergies and linked to Learning Outcome 3. Many foods can have allergenic components such as nuts, egg and flour; tutors can encourage learners to discover these present in food label examples.</p>	1 hour	
How do we know what is in our food?	<p>Learners could research E numbers and choose several examples such as antioxidants, thickeners, sweeteners and gelling agents etc and then produce a table of name, type of chemical, functions, uses, any side effects and other possible effects on health or wellbeing.</p> <p>When learners have completed their table they can share their results with other members of the class. Tutors could link this to the first two activities suggested for this Learning Outcome.</p> <p>Current EU approved additives and their E Numbers Food Standards Agency https://www.food.gov.uk/science/additives/enumberlist An excellent summary.</p> <p>E Number Index The UK Food Guide http://www.ukfoodguide.net/enumeric.htm Another useful resource.</p> <p>What are food additives and E numbers? NHS Choices http://www.nhs.uk/chq/pages/1125.aspx?categoryid=51 Guidance from the NHS.</p>	1–2 hours	





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