Zig Zag Education

Food and Nutrition GCSE (9–1) | Eduqas | C560

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Course Companion

for Eduqas GCSE Food Preparation and Nutrition: Diet and Good Health

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POD 8251

Contents

Teacher's Introduction

This resource is designed to meet the Area 3: Diet and Good Health element of the Eduqas GCSE Food Preparation and Nutrition qualification.

What it covers
The resource comprises three chapters covering the following:

Chapter 1: Diet and good health
• Energy requirements of individuals • How to plan a balanced diet • The relationship between diet and health

How to use this resource
The resource covers all aspects of the Area 3: Diet and good health element, and is designed to increase knowledge of the topic and enable learners to test their understanding and skills through a variety of assessment methods.

Learning outcomes enable the learner to clearly see what they are expected to know at the end of each chapter.

The **Overview** provides a brief summary of what will be covered in the chapter and the **Key Terms** box provides information on key terms within the resource (key terms are emboldened within the chapter text).

Did you know	These boxes contain handy tips
Things to think about	These boxes provide learners with a chance to develop cognitive skills, do some research (books, Internet, people) and take part in a discussion
Apply	These boxes provide the learner with the opportunity to further their skills, either through cognitive or practical application
Qs	Test learners' knowledge and understanding through quick Y/N questions
Skills	Based on the 'suggested application of skills' section of the Eduqas GCSE Food Preparation specification, these questions test learners' skills in food safety through practical application
Exam tip	Useful tips to help the learner concentrate on important aspects that may appear in the final assessment
Check your understanding	Multiple-choice, short-answer and extended-answer questions appear at the end of each section to test knowledge and develop understanding.
Answers	Answers to questions are provided at the end of the resource

M Golebiowska, March 2018

Diet and good health

Overview

This chapter will help you understand what dietary guidelines are and what they are used for. You will learn how to assess people's nutritional needs and adjust meals to them. You will also discover how much energy a person needs and how to plan and modify recipes to meet those needs. Here you will also find information on how food affects human health.

Learning outcomes

After studying this chapter, you should be able to

- ❑ understand current guidelines for a healthy
- ❑ adjust meals and recipes to the needs of di
- ❑ plan a balanced meal or modify recipes for s
- ❑ know what BMR is and what it is used for
- ❑ understand the relationship between diet,
- ❑ identify the m t-related health condit
- ❑ car od nu onal analysis
- ❑ lan and adjust diets to specific diet-depend

Key Terms

Atherosclerosis	A condition in which cholesterol and calcium accum walls of the blood vessels, causing them to stiffen a
BMI	Body mass index; a tool to assess whether body we given person
BMR	Basal metabolic rate; the amount of energy needed functions such as heartbeat, breathing and maintai
Coeliac disease	A serious, genetic condition caused by intolerance the intestines and impairing absorption of nutrient
Coronary heart disease	A condition in which cholesterol plaque builds up i the heart
Family budget	The amount of money a family has to manage over period of time, e.g. a week or month
Gluten	A protein found in wheat, rye, barley and sometime
Growth spurt	The process of active, rapid height increase in child
Hypertension	The condition usually caused by excess of sodium, l exceeding 140/90 mm Hg
Iron deficiency anaemia	The condition which is the effect of low iron intake blood cell count / low haemoglobin levels in the bl
Lactose	A disaccharide found in milk, built of one glucose a
Lactose intolerance	A condition in which milk sugar cannot be digested bloating, and diarrhoea; can be caused by genetic f during life (most often)
Menstruation	The process of en ale monthly bleeding
Obesity	A co ion in which BMI is greater than 30 any other health conditions
Osteopor	Brittle bone disease; a condition caused by lack of c in weak, brittle, easy-to-break bones; occurs in adu (common)
Overweight	A condition in which BMI is between 25.01 and 30.0
PAL	Physical activity level; the level of daily activity, wh needs of a person
Rickets	A condition in children caused by calcium and vitam bones, improper body posture, impaired teeth and legs, and tooth loss
Type 2 diabetes	Disease caused by improperly working insulin or la hormones produced by the pancreas

Energy requirements of indi

Energy balance means that the same amount of energy is being provided with the c
Keeping the energy balance is very important in maintaining a healthy body weigh
likely to cause weight gain, and eating less than required can cause weight loss. En
depending on age, sex, weight, height, body composition, occupation, physical act
as state of health. In this chapter you will learn how to assess the energy requirem

Basal metabolic rate and physical activity level

Basal metabolic rate (BMR) is the amount of energy a perso needs to carry out the basic life processes throughout the day, su as breathing, heartbeat and maintaining stable body heat. Ba etabolic rate is different for every person and depe on various factors. On average, BMR equals one kilocalorie per kilogram body mass per hour.

BMR = 1 body mass in kg × 24 hours

There are four main factors that affect BMR:

1. **Weight** – because the more tissue there is to nourish, the bigger the need for energy and nutrients
2. **Height** – for the same reason
3. **Age** – because younger people usually have more lean muscle tissue than the elderly, and muscles need more energy than fat tissue
4. **Sex** – men usually have more muscle tissue than women and, therefore, need more energy

Factors influen basal metaboli

age

Apply

Calculate your own BMR using the two equations provided on this page. Do they differ? Why / why not?

Another way of calculating one's BMR is to use the Harris–Benedict[1] equation.

Men	BMR = (10 × weight in kg) + (6.25 × height in cm) – (5 × a
Women	BMR = (10 × weight in kg) + (6.25 × height in cm) – (5 × a

Physical activity level (PAL) reflects the activity of a person during the day – that cleaning, walking, doing sport, shopping and even getting dressed. Occupation a manual workers (e.g. builders) need more energy than people who work at a des Depending on how much we move during the day PAL can be considered low, m

Action	Energy expendi
Sleeping	65
Knitting	111
Wash	144
Walki	200
Swimming	500
Running	570
Walking up the stairs	1100

Energy expenditure of different activities in kcal per hou

[1] Harris–Benedict equation revised by Mifflin et al. in 1990, Mifflin M D, St Jeor S T, Hill O (1990). **'A new predictive equation for resting energy expenditure in healthy indiv** *Clinical Nutrition*. **51** (2): 241–247. **PMID 2305711**

As you can see in the table on the previous page, different actions require differe
them. Therefore, a person who leads a **sedentary lifestyle** will need less energy
active.

Lifestyle	PAL
Sedentary lifestyle	1.4–1.69
Moderately active	1.7–1.99
Very active	2.0–2.4

Apply

Using PAL
count the
family mer

How to use PAL? You need to assess how active a person is (what their job is, wh
a car, whether they ride a bike once a week or run five mi
very day). The mo
their PAL will be. To calculate what the total ene
diture (TEE) of a perso
BMR by PAL.

BMR × PAL = TEE

BMR and P
im
nt in judging how much energy a person needs and how
requiremen
maintain your weight, it is important to not exceed the TEE. It
the energy comes from different sources. All of these factors determine how to

You may find that some sources refer to EAR. EAR stands for Estimated Average
calculated for an entire population (not an individual). EAR is an average value, w
population will need more energy and some of the population will need less ene

Research

You can explore more information on PAL at **zzed.co.uk/8251-energy-req**

Energy requirements differ for different life stages. In fact, infants and children
than adults compared to their body size. For this reason, the equations discusse
calculating energy requirements of children. Instead you could use recommenda
updated periodically by relevant authorities. The estimated energy requirement
ages are shown in the table below.

Age	Boys	Girls	Age	
1 year	765	717	8 years	174
2 years	1004	932	9 years	184
3 years	1171	1076	10 years	203
4 years	1386	1291	11 years	212
5 years	1482	1362	12 years	224
6 years	1577	1	13 years	241
7 years	1649		14 years	262

Source: British Nutrition F

Apply

Using the equation for BMR, calculate the energy needs of a moderately active
0-year-old of average height and weight. Compare the results with the require
Explain potential reasons for any differences.

Sources of energy

A healthy, balanced diet should comprise carbohydrates, fats and proteins in the correct amounts. The latest recommendations indicate that a healthy diet should be based on carbohydrates, especially complex carbohydrates (starch). The recommended percentage of energy intake for a balanced diet is shown in the table below.

Did you kno

1 gram of fats provides 9 kc
1 gram of carbohydrates pr
1 gram of protein provides
1 gram of alcohol provides

When planning a diet, you can use this data to calculate how much of each ingredient you can use. For example, if you are plan that 50% of energy (1,000 kcal) should come from carbohydrates. Knowing that 1 3.75 kcal, you are able to calculate that you should include approximately 267 g o

	Percentage	Amount in grams
Protein	up to 15%	75
Fats	maximum 35%	78
of which saturated fats	maximum 11%	24
Carbohydrates	50%	267
of which starch	45%	240
of which sugars	5%	27
Fibre	-	up to 30 grams

Recommended percentage of energy intake for a balanced 2000 kcal diet

App

Plan a
spagh
old ch
70-ye

The composition of their diet may differ for different people depending on their i example, a marathon runner will need more carbohydrates, while a weightlifter w people suffering from certain diseases these proportions might not be appropria cystic fibrosis it is recommended to provide a high-fat diet to compensate for the other hand, some people may require a lower intake of certain nutrients, e.g. pe phenylketonuria need to eat a low-protein diet throughout their life.

How to maintain a healthy body weight

You already know that BMR and PAL are important for assessing one's energy ne
body weight' mean?

Scientists and dieticians around the world have designed multiple tools that help
weight is correct or not. One of the most popular indicators of this is the **body m**
for which you need body mass in kilograms and height in metres.

BMI = weight in kilograms / height in metres ^{2}

Remember, that being underweight is just as dangerous as being overweight!

There is a number of rules to follow in order to maintain
healthy body weight – most of them are shown on the
Eatwell Guide. Can you remember them?

BMI < 18.5
18.51–25.0
25.01–29.9
>30.0

The effects of weight loss

Weight loss may be cause by various factors, such as not eating enough (malnutri
some genetic and metabolic disorders, and certain diseases.

Some people may choose to intentionally limit the amount of food they are eatin
we speak about *anorexia*. Anorexic people eat very little, and, therefore, their bo
building material to repair and grow cells and tissues. In anorexia, we can observ

- very thin, wrinkled skin – as the body lacks protein to build the cells, and vit
- tooth loss – lack of vitamin C causes the gums to recede, and lack of vitamin
  decay; together, they cause tooth loss and trouble with eating
- weakness – in the face of sugar deficiency, the body breaks down muscles in
- thin, brittle hair and nails – due to lack of minerals and vitamins to strengthe
- lack of menstruation in women – as fat is needed to produce sex hormones,
  hormonal cycle to arrest

Treatment of anorexia usually requires medical attention and psychotherapy, as
needs to be high in energy and protein, but the portions of food need to be very s

The effects of weight gain

Weight gain can be an effect of an imbalanced diet, hormonal issues or certain diseases. Overweight and obese people are at an increased risk of many diseases, such as type 2 diabetes or coronary heart disease.

When planning a low-calorie diet for an obese person
- calculate their BMR and PAL
- calculate their TEE
- subtract 500 kcal from the TEE to know how many calories they should consume every day

As you know, eating less than needed will cause weight loss, which is the desirab
Eating 500 kcal less a day allows someone to lose approximately 0.5 kg of adipos

Check your understanding: Energy requirem

1. Which of the following requires the most energy? (*1 mark*)

   a. running ☐ c. walking
   b. swimming ☐ d. walking up st

2. How much energy should be derived from carbohydrates in a balanced

   a. up to 35% ☐ c. maximum 5%
   b. up to 15% ☐ d. around 50%

3. How much fibre should be provid[illegible] w[illegible]h [illegible]alanced diet? *(1 mark)*

   a. 20 g ☐ c. 30 g
   b. 20 mg ☐ d. 30 mg

4. L[illegible] four factors that directly affect BMR. (*4 marks*)

   .....

   .....

   .....

   .....

5. Explain why we can't use the Harris–Benedict equation to calculate th children. (*2 marks*)

   .....

   .....

   .....

   .....

6. State three benefits for health of physical activity. (3 *marks*)

   1. .....

   2. .....

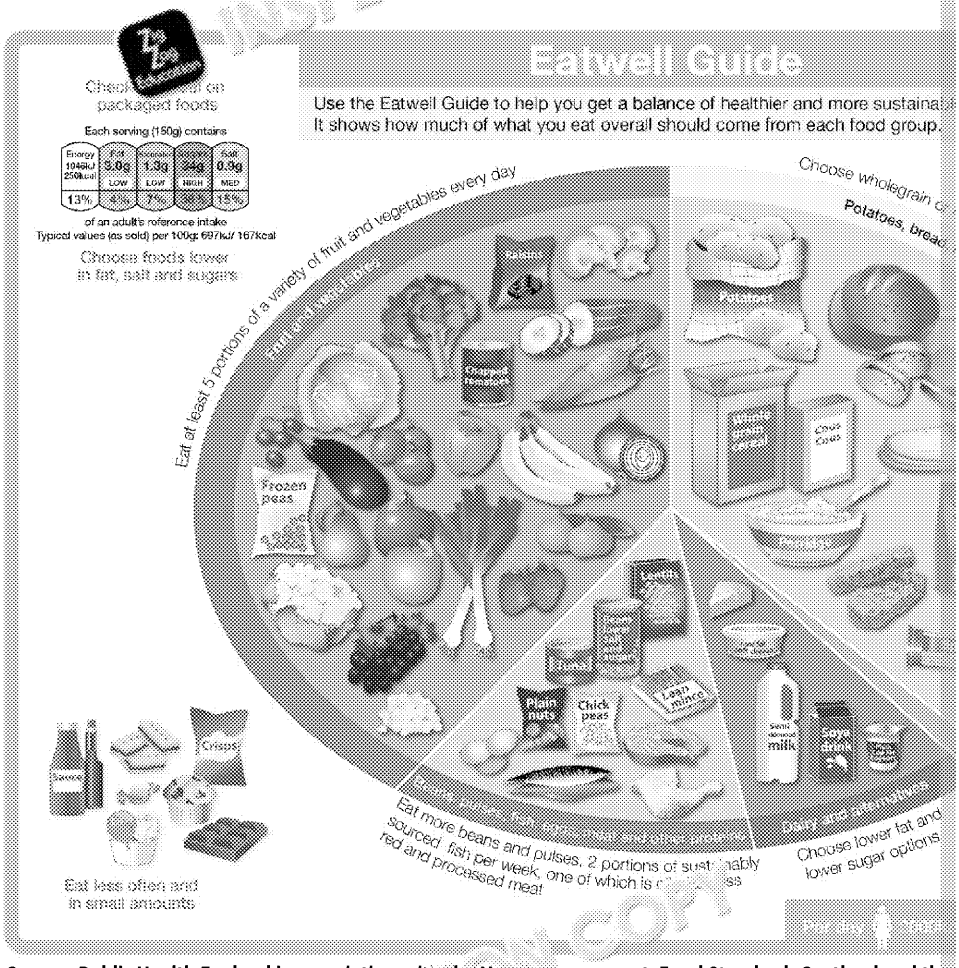
   3. .....

How to plan a balanced

You are what you eat. This truth was discovered in the nineteenth century and has stayed with us ever since. It is very true – your body uses all the macro- and micronutrients you provide through your diet to build its own cells, carry out processes, and allow you to breathe, move and think. Eating a balanced diet is necessary to maintain health, and, therefore, it is crucial to know how to actually balance it. Making informed choices is the first step – once you know how to choose the best ingredients, you will be able to mix and match them to provide your body with delicious, healthy meals.

The Eatwell Guide

The Eatwell Guide is a graphic repr[illegible] of how to balance your meals thro[illegible] correct proportions betwe[illegible] nutrients and gives some advice on food cho[illegible]



Source: Public Health England in association w[illegible] Government, Food Standards Scotland and th[illegible]
© Crown copyright 2016

Notice that [illegible]an [illegible]egetables along with starchy foods make up the biggest p[illegible] the proper [illegible]f vitamins, minerals, fibre and carbohydrates to keep you hea[illegible] your diet should comprise up to 35% of vegetables and fruits and another 30% o[illegible] bread, pasta, rice or potatoes.

Another 10% to 15% of your diet should be made up of protein sources, such as [illegible] ensure proper growth, development and repair of the tissues and organs. Aroun[illegible] milk and dairy products – that is to provide adequate amounts of calcium, phosp[illegible]

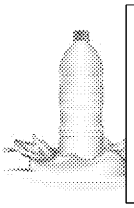
Notice that oils and fats take up only around 2% of the plate – that is because th[illegible] foods (such as meat, fish, milk and cheese), so there is no need to provide any m[illegible]

There is also other important information contained in the Eatwell Guide. In the
read product labels carefully to make informed choices about what you buy and
reminds you to cut down on sweets and snacks, which are usually high in sugar a
trans fats). The top right corner is a reminder to drink water regularly – either in
juices, milk, tea or coffee. This is to ensure proper hydration / prevent dehydrat
also helps cut down on snacks. In the bottom right corner there is an estimated
and men – remember that all foods and drinks count.

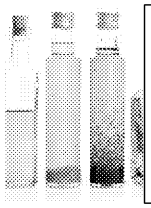
Eat at least five portions of a variety of fruit and vegetables every day.

Base meal
pasta and
carbohydr
versions w

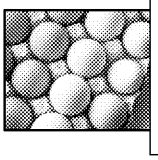
ve some dairy or dairy-free
rnatives (such as soy drinks), choosing lower fat and lower sugar options.



Drink six t
fluid a day



Choose unsaturated oils and spreads and eat in small amounts.



Eat some
meat and
two portio
of which s

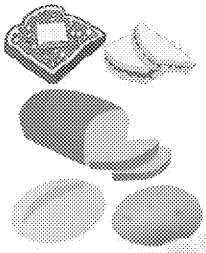
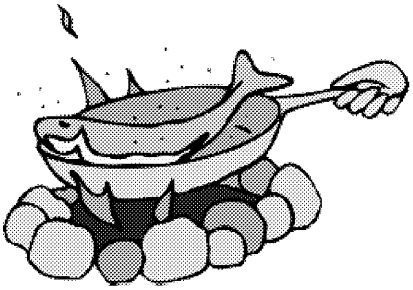
The Eatwell Guide in a nutshell

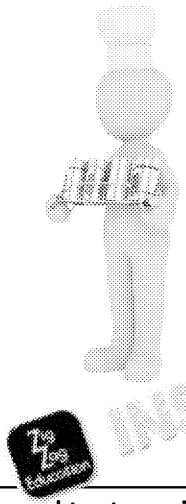
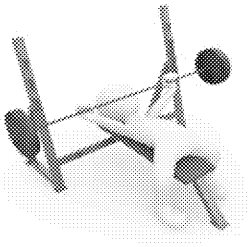
Apply

Write down all of the foods and drinks that you have consumed during the last 2
whether you meet the Eatwell Guide criteria for a healthy, balanced diet.

The eight tips for healthy eating

This is another guideline for making healthy food choices. It's a general list of do
diet.

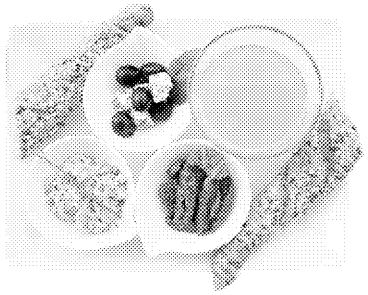
Tip	Why is it im
Base your meals on starchy foods 	• This includes **wholemeal** bread, p some vegetables. • They are an important source of fibre, group B vitamins and certa phosphorus. • They b ne dish and provid fe **satiety for longer**, so you don't end up craving sweets. • Ideally, a starchy ingredient shou be included **in each meal**.
Eat a nd vegetables 	• Vegetables are an important source of minerals, vitamins, diet reason you should eat them regu • Fruit, except for the nutrients list and should be consumed in smal fresh fruit rather than juices or p and contribute towards obesity a • A portion of fruit or veg equals a one large fruit such as an apple, a small fruit such as plums, or a ha blueberries.
Eat more fish 	• Fish are a source of complete pro vitamin D. They are indispensab • It is ideal to eat at least one port (this includes salmon, mackerel, h • Lean fish, such as haddock or cod • When choosing your fish, remem → deep-fried fish provide much for grilled, steamed or baked → canned and smoked fish are eat them less often
Cut down on saturated fats and sugar 	• Fat is important in maintaining h thing is… a ba thing. • Satur ats increase cholester th risk of cardiovascular disease • Sugar increases blood sugar level and increasing the risk of type 2 d • Both saturated fats and sugar co is one of the major diet-related p • When choosing your food, opt for • Exception: whole milk, which, as vitamins A and D. • Ideally, you should limit consump your daily calorie intake. For an a can of fizzy drink, or about one s • When shopping, pay attention to able to spot a 'traffic light' label, product contains a high, medium

Tip	Why is it i
Try to eat less salt 	• The UK government suggests tha 1,600 mg of sodium a day (this is salt). The World Health Organizat maximum level to 6 g of salt a da • Excess sodium consumption is re blood pressure), stroke, heart fai cancer and many other condition • Salt comes from a variety of food unprocessed produce in order to often hid the most surprising sa at preserves and brea Over two thirds of adult Britons e which puts their health and well- • To limit the amount of salt in the your foods at the end of cooking, and spices.
Get active and try to maintain a healthy weight  	• Being underweight is just as bad a case, it is not a good idea to 'go o order to lose a couple of kilogram • It is best to increase physical acti and body composition – your we that's because physical activity h are, well, quite heavy. • Physical activity brings many hea general condition and stamina, lo lowers the blood pressure, helps provide more oxygen to all of yo look and feel better. • Make sure you choose the kind o you – for example, swimming pu be good to begin with, while run your knees, so might not be good • Children and teenagers should ex every day, and on three days a w activities for strong muscles and • Adults should get at least 150 mi activity every week (or 75 minute
Drink plenty of water 	Water is essential for life and goo helps to prevent heat stroke, pre minerals. • Ideally, adults should drink betwe (or 30 ml per kilogram of body ma fact, many foods we eat also provi

Apply

Inspect the labels of differen
words used to describe add

[2] Department of Health, Dietary Reference Values for Food Energy and Nutrients for th

Tip	Why is it i
Don't skip breakfast 	Skipping meals puts your body i fact causes you to gain weight r considered by many to be the m Here is why: • it's the first meal after a lon snack at night, which is a ve • it provides the energy neces • it provides the energy nede proved t! at not eating breal a ec s your performanc A healthy breakfast should ideal provide complex carbohydrates, dietary fibre and complete protein. It is usually OK to include little sugar, which will provide an immediate energy boost.

Did you k ?

The na kfast literally means 'b king the fast' of the night.

D

The ol
breakf
like a p
like a p

Apply

Following the eight tips for a healthy diet, plan a daily meal plan for a teenager. T
go to **zzed.uk/8251-explore-food**

Research

Other important information on how to eat and what to eat may be found on

- National Health Service websites, such as **zzed.uk/8251-nhs**
- Public Health England **zzed.uk/8251-department-health**
- British Nutrition Foundation **zzed.uk/8251-nutrition**

Things to think about

Discuss the differences a in ies between the two guidelines d

Nutritional needs when selecting recipes for differe

When selecting and modifying recipes for different groups of people, it is necessa
following factors:

- their age and the nutritional requirements for their age group (to include po
  nutrients)
- their state of health, to include diet-related diseases, and food allergies and
  exclude some ingredients and choose the correct cooking methods)
- their religion, and ethical and moral beliefs (also helps to filter the allowed i
- their personal preferences (as some people may feel a particular aversion to

Calculating the nutritional value of food

To calculate the nutritional value of food, you might need to use food tables or a
contain more or less complex information about the nutrients in a given food pro
calculate the amount of a chosen nutrient in a portion of food. By adding up the
foods, you are able to calculate the nutritional value of a dish, meal and whole di
nutritional value, it is important to take into account the individual needs of a pe
accordingly.

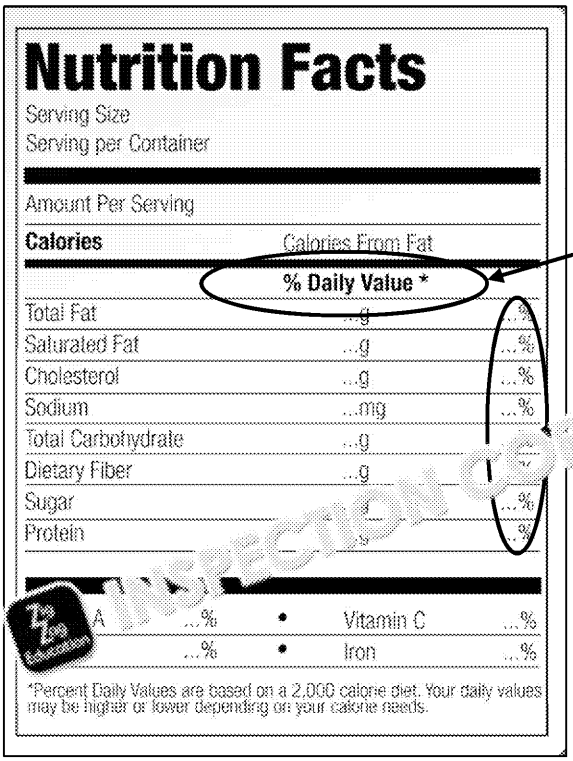
Apply

Research a recipe for chicken curry. Then calculate its nutritional value using t
zzed.uk/8251-explore-food

You can also attempt to calculate the nutritional value of food using the data pri

	Per 100 g	Per portion (180 g)
Energy (kJ)	217	391
Energy (kcal)	51	92
Fat (g)	<0.5	<0.5
Saturates (g)	<0.1	<0.1
Carbohydrate (g)	13	23
Total sugars (g)	11	21
Fibre (g)	0.9	1.6
Protein (g)	0.8	1.4
Salt (g)	<0.01	<0.01

A large
180
informat
100 g of
how ma

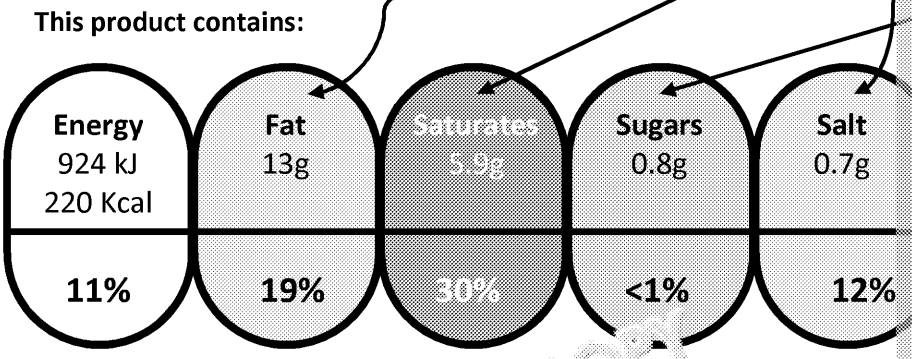


An
(ca
ma
10

How
refer
porti

Some products have the same information presented in more graphical form, su

The colours represent whether the product provides a high, medium or low percentage of the daily reference intake for a given nutrient.



If there a
added, it
amount a

Apply

Assess the nutritional value of a traditional English breakfast consisting of:

2 fried eggs

1 sausage

50 g of baked beans in tomato sauce

1 slice of white toast with butter

2 hash browns

1 fried mushroom

Apply

Prepare a ham and che
information on the pac
energy and macronutri

Apply

Check the labels of th
sausages and assess wh
appropriate for the eld

Modifying recip

Not all reci su itable for everyone. Some people will not like the taste, oth
texture, and s will not be able to eat the dish due to food allergies or other
reason, it may be necessary to modify the recipe so that it becomes suitable for a
The modifications may include:

- changing the amount of an ingredient, e.g. using less fat to make the dish le
- substituting an ingredient, e.g. cow's milk with plant milk, sugar with xylitol
- changing the cooking method, e.g. grilling instead of frying
- adding other ingredients, e.g. to increase the amount of fibre
- reducing the amount of a nutrient, e.g. sugar or salt

Things to think about

Discuss the health benefits of the modifications described above.

Some recipes must also be modified in order to remove or avoid food allergens.
allergens – you can see them printed in **bold** when inspecting food labels. It is ve
is allergic to a particular substance does not eat food containing it as this may lea
called anaphylactic shock. For example, cow's milk might need to be substituted
need to be replaced with a suitable substitute in a recipe. You will discover more
learning about food labelling later in this course.

To adjust the food to the requirements of a consumer, it might also be necessary

Portion sizes

It is quite obvious that adults need more energy and, therefore, more food than c
reflected by the portion size. For example, a standard portion of yoghurt is 150 g
on average, as much calcium as two slices of Cheddar cheese (which is also one p

You will learn more about portion sizes when discussing food choices.

Research

You can explore more information on portion sizes on **zzed.uk/8251-portio**

Apply

Assess and compare the nutritional va[illegible] two types of breakfast cereal (in l
one is more appropriate for te[illegible]ving reasons for your answer.

Case stud

Claire is a 35[illegible]old office worker. With the height of 1.58 m and a weight of 67 kg, she is overweight and has recently noticed bloating and discomfort after drinking her favourite latte. She is very busy, as she works from 9am to 5pm and then goes swimming three times a week. She is a bit concerned about her health because her grandma was recently diagnosed with diverticulitis – Claire knows that having a sufferer in the family increases her risk of becoming ill too. Claire tries to follow a vegetarian diet, since she cares a lot about animal welfare.

To plan a balanced diet for Claire, you need to:

- check her age and sex – together with height and weight, these parameters v
much energy Claire needs every day; you might use a Harris–Benedict equat
previous section)
- check her physical activity – you can state that Claire is moderately active, s
is around 1.7 (see previous section)
- check her state of health – Claire is above the ideal BMI range (26.84 kg/m^2)
lactose intolerance; she also is at risk of developing diverticulitis
- check her lifestyle – she is busy and probably has no time for cooking; she is

Thanks to this information, you are able to say that:

- Claire needs a low-calorie diet to lose some weight and regain a healthy bod
- she might need extra protein and complex carbohydrate to give her energy b
develop and maintain the muscle tissue
- she might need to eliminate milk and unferm[illegible]d dairy products from her
- as she's a vegetarian, she might nee[illegible]e the protein complementation te
biological value protein in he[illegible]t
- Claire might need a [illegible] diet to lower the risk of developing diverticuli
- the re[illegible]or [illegible] must be easy and quick to cook

Check your understanding: How to pla

1. Excessive consumption of which nutrient can cause hypertension? (*1 m*

   a. calcium ☐ c. sodium
   b. vitamin K ☐ d. vitamin A

2. A risk factor for coronary heart disease is… *(1 mark)*

   a. high saturated fat intake ☐ c. high unsatura
   b. low saturated fat intake ☐ d. not using fat

3. Fish in a diet do NOT provide… *(1 mark)*

   a. protein ☐ c. omega-3 fatty
   b. vitamin E ☐ d. vitamin D

4. Vegetables provide us with minerals and vitamins. Identify one mineral in vegetables, and give one function of each in the body. *(4 marks)*

   Mineral .....

   Function .....

   Vitamin .....

   Function .....

5. Give two reasons why people should cut down on saturated fats. (*2 m*

   1. .....

      .....

   2. .....

      .....

6. Discuss how and why starchy foods are included in the current dietary guide and the eight tips for healthy eating. (*5 marks*)

   .....

   .....

   .....

   .....

   .....

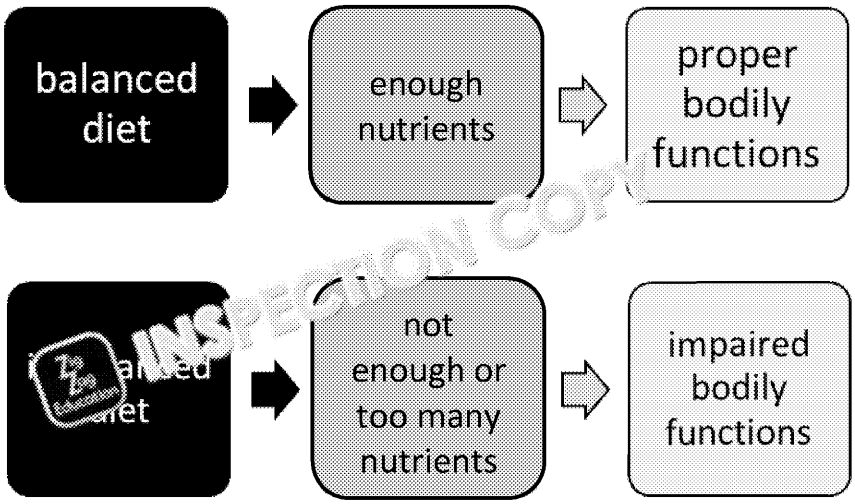
   .....

   .....

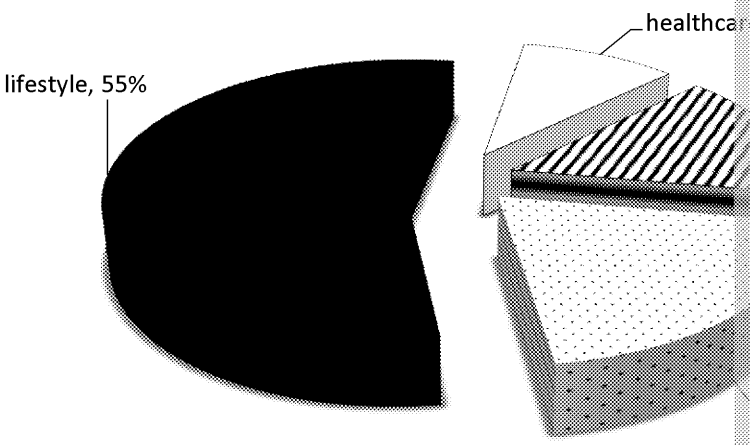
   .....

The relationship between diet a

Diet is an important factor which can both protect from and cause certain diseas
body with nutrients, which are necessary to carry out all of the bodily functions a
enough nutrients provided, the body remains healthy. Both excess and deficienc



According to Marc Lalonde's 'health field' concept, there are four major factors t



Marc Lalonde's health field concept (http://www.phac-aspc.gc.ca/ph-sp/pdf/

According to the idea, as much as 55% of our health d ds n our lifestyle – w
Thus, it is extremely important to lead a healt l est to maintain health and

Nutritional and dietary needs of different life stage

The nutritional needs of a person change with age, sex, physical activity, state of h
also be affected by other factors, such as ethical and moral beliefs. Different peo
and these have to be taken into account when planning diets for them. A healthy
that all the nutrients are provided in the correct amounts, and helps to decrease t
In this section we will discover how the nutritional requirements differ depending
of different people.

During different life stages, people have different nutritional needs – either due t
development, or in order to avoid diseases.

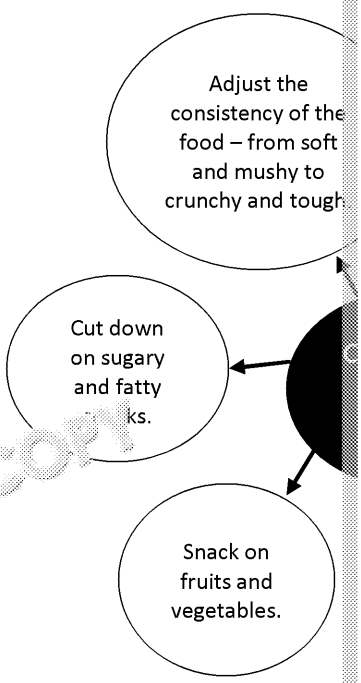
Toddlers (from one to three years old)

Toddlers are little children who are just beginning to walk. This means that their
they need energy to move their muscles. Also, the need for protein, calcium and
undergo their first **growth spurt**. According to guidelines, toddlers should eat fiv
five portions of fruit and vegetables, three portions of dairy products and two po
(vegetarians should eat three portions of protein-rich foods to ensure the
protein). When planning meals, remember that these portions are relatively sma
age and size of the child – generally, a portion should fit into their hand. A toddle
possible – toddlers may be picky and lack appetite, but it is worth introducing ne
that their taste buds can adjust to the new flavours and textures. The texture of
adjusted, as at this time children grow their teeth – first introduce mushy, purée
foods cut into small cubes, and, at the end, introduce tougher foods that need bi
carrot. Drinks should still include pure water, milk, and some diluted fruit juice.
contains almost no fibre but is rich in sugars, and so children might prefer to fill u
the more important foods.

Diet for toddlers – general rules

Ap

School-age children (four to 11 years old)
During the next couple of years, children discover the surrounding world. That also includes food – every time you prepare a meal for children, try to introduce new ingredients. This will pay off in the future and allow a very diverse, balanced diet. Another advantage is that early introduction of foods helps reduce the risk of **food allergies**. At this stage children also learn how to use cutlery and are especially eager to learn, so be the role model. Children should eat five meals a day – that includes breakfast, lunch, dinner and two snacks in between. A cup of milk before sleep is also acceptable. The diet should be as varied as possible and rich in vitamins and proteins. Avoid fatty, sugary snacks and drinks and instead give the child a bottle of water and fresh fruits and vegetables for snacks. It is also advisable to encourage children to eat fish, milk and dairy products to avoid rickets and tooth decay.



Apply

Go to **zzed.uk/8251-healthy-lunchbox** and create your own healthy lunch
how you could improve it to meet the guidelines for a healthy diet for school

At school, children need a lot of energy to focus on lessons. They also meet a lot
that they are exposed to many new microorganisms and their immune system ne
off. Children of this age are often influenced by their peers and the media (e.g. te
often, the Internet).

Many parents prepare lunch boxes for their children, but it might be worth consi
this helps to introduce a greater variety of products into the diet. The diet for sch
generally be based on the Eatwell Guide, with the portion sizes adjusted.

Children should be encouraged to be physically active (PE lessons are often not e
peer group is larger, the child might refuse to eat certain foods (e.g. vegetables) o
fizzy drinks). Try to introduce low-sugar or sugar-free foods to provide the swee
body weight or tooth health.

Remember that breakfast is the most important meal of the day – it should provi
dietary fibre, complete protein, and little fat. An example of this is oatmeal with

Teenagers

During adolescence, girls and boys face a period of rapid growth that is called **gro**
To meet all of the needs of their developing bodies, they should pay attention to
intake.

Increase the amount of protein	To allow proper gro
Choose sources of fats wisely and adjust the amount	Fats are necessary to produce hormones) but excess may lea
Drink milk and eat dairy, and other calcium-rich products	To avoid rickets and tooth dec
Choose whole grains	To avoid overweight and obes fibre, and to keep the blood su
Eat iron-rich foods	Thi... pecially important fo at this stage of life; remember vitamin C to prevent **iron-defi**
Eat five portions of vegetables and fruits daily	To boost your health and imm

During ado...e, it is important to provide the body with the energy it needs, significantly than those for younger children. To increase the variety of fo lunch in school instead of taking lunchboxes with them. School lunches are usua accordance with national dietary guidelines, which assures their quality.

Apply

Think of ways of including five portions of fruit and vegetables a day in a diet for

Adults (19 years and over)

Adults are fully grown and developed and, therefore, their need for certain nutri are also usually less active (no weekly PE lessons) so their energy need is also sm important to focus on preventing certain diseases, which might develop as an ef in life.

Ensure proper intake of calcium and vitamin D to prevent osteop

Choose iron-rich foods or supplement iron to avoid iron-def

Cut down on sugar and fat to avoid obesity, type 2 diabetes

Cut down on salt to prevent high blood pressu

BE ... to prevent osteoporosis, lean muscle tissue los

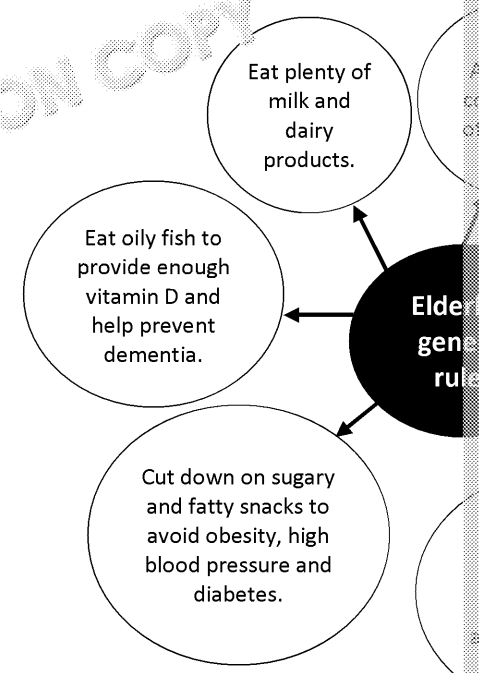
Elderly (over 65 years old)

Ageing is an unstoppable process that makes our bodies less active and less full o
people age. The elderly usually have significantly less lean muscle tissue than yo
therefore, need less energy. Unfortunately, their digestive tract ages as well – the
causing ulcers or heartburn, their teeth begin to fall out, and even the bowel does

For those reasons, it is important to adjust the diet to the needs of the ageing bo
risk of developing certain conditions, such as **osteoporosis**, **hypertension**, **type 2**
obesity or **coronary heart disease**. It is important to ensure that lifestyle helps s
conditions or, ideally, prevent them.

A few rules are worth remembering:

- a high amount of fibre helps prevent bowel cancer, but it is also necessary to drink plenty to
constipation (and d
which
certain
- adjust the consistency of food to meet the needs of those who have lost their teeth
- limit the amount of salt to prevent **hypertension**
- make sure the diet provides a sufficient amount of calcium to prevent **osteoporosis** – if not from milk (lactose intolerance is common among adults), then from other sources such as pilchards or almonds



Elderly people are also at more risk of developing anaemia, usually associated w
red blood cells, which can be caused from interfering medication, other chronic i
iron and vitamins. Alternatively, anaemia can result from increased bleeding fro
illnesses such as stomach ulcers. As a result, it is important that the elderly cons
vitamin C and vitamin B12 in their diet to reduce the effects of this condition.

Dietary needs of specific dietary groups

There are different reasons behind food choices, which need to be taken into ac
These can include ethical or philosophical beliefs and health conditions that requ

Ethical and philosophical factors behind food choices

Various life experiences, ethical views and knowledge cause people to revise the
more and more common to see vegetarian and vegan eateries across the country

Vegetarianism can be divided into several of subgroups, including:

- lacto-ovo vegetarianism – which allows consumption of milk, dairy products
- lacto vegetarianism – which allows consumption of mil nd dairy products,
- ovo vegetarianism – which allows consumptio s, but not milk or dairy

Veganism is a kind of vegetarianis e ly consumption of fruits and veget
hurt any living organism. T hat vegans cannot eat milk, dairy, eggs, la
single product f an n. There are strict variations of veganism such as vi

Vegetarian a egan diets have many benefits, but they may also be controvers
vegan or vegetarian diet for people who suffer numerous food allergies, for exam
will be seriously narrowed. Some people also claim that these diets are more co
this might be true, since vegetarians and vegans often choose fairtrade, organic f
than their common equivalents. Dieticians may also find it not suitable for pregn
since their bodies have special needs. The advantages and disadvantages of veg
shown in the table below.

	+ (advantages)	
Vegetarianism	+ Rich in vitamins + Rich in fibre + Usually provides enough protein + Very varied diet + Usually suitable for children and pregnant women	– Costly – Sometim
Veganism	+ Rich in water-soluble vitamins + Rich in fibre + Varied and colourful + Promotes weight loss	– Very cost – Difficult t – May lead fat-solub – May lead as this or origin – May lead anaemia – Time-con – Not suita pregnant

Benefits and drawbacks of vegetarianism and veganism

Since vegetarians and vegans do not eat meat, it is necessary to pay special atte
this reason, vegetarian and vegan diets are usually rich in legumes, nuts and see
intake and protein complementation to avoid deficiencies.

You can learn more about protein complementation and sources of vitamins in t
– Principles of nutrition.

Health conditions that require special treatment

There are some conditions that force people to avoid certain foods. These includ
and lactose intolerance, as well as food allergies.

Coeliac disease is a condition in which **gluten** (the protein in wheat, rye, barley a
processed properly in the small intestine. Eating gluten may lead to inflammatio
the villi, impaired absorption, painful bloating and diarrhoea. Since villi are being
may occur. People suffering from coeliac disease have to follow a strict gluten-fr
avoid these issues.

Allowed	N
• Rice, millet, quinoa, buckwheat, corn starch, potatoes • Any product made with the use of the abov • Any other food – vegetables, fru fish, eggs, milk, etc. • Oats – only if co gluten-free	• Wheat, rye, barley Any product made grains (such as flo cakes, sauces and • Breaded products breaded ham

Products allowed and not allowed in a gluten-free diet

When plann meal for someone suffering from coeliac disease, it is crucial to
unallowable products may be harmful.

Research

Find out other foods which can and cannot be eaten by coeliacs. Visit **zzed.uk**
what to look for on a food label when shopping for a coeliac.

Lactose intolerance is another health condition that has specific dietary requirements. Lactose intolerance may occur in childhood, but most often it is diagnosed in adults. Eating anything that contains **lactose** (or milk sugar) may cause stomach ache, painful bloating, diarrhoea and other issues. To avoid these problems, it is highly recommended to avoid any food that contains lactose – that includes milk and some dairy products. If the intolerance causes only mild symptoms, a person can try to eat yoghurt or cheese, since the lactose in them is already processed by the bacteria.

Du
yog
pro
lact

To balance a lactose-free diet and ensure proper intake of calcium and vitamin D
(especially oily sea fish) and other calcium-rich products such as broccoli, kale, le

Allowed	N
• Any product labelled as 'lactose-free' • Any vegetables, fruits and eggs • Butter • Sometimes yoghurt or chees ptoms are very mild • Fish • Ch • Yogi • Other fermented dairy products*	• Milk Cream cheese • Cottage cheese • Buttermilk • Cream • Pancakes • Ice creams • Some sauces, cor meats and cold c sweets, biscuits a read the label to powder added. • Some medicines

Products allowed and not allowed in lactose intolerance

**During fermentation, lactose is transformed by probiotic bacteria into lactic acid, and, therefore, j and cheese can usually be eaten in small amounts by lactose intolerant people.*

There are more and more **food allergies**, and it is extremely important to avoid c
diagnosed. Food allergies usually develop in the childhood, but sometimes they c
people who suffer from allergies have to avoid the allergen for their entire life – b
grow out of the condition.

When preparing food, it is important to avoid cross-contamination – it is best to s
and use dedicated tools when preparing and cooking them. The unintentional co
cause various symptoms, from mild (e.g. skin rash), through medium (e.g. swellin
(anaphylactic shock). The most common allergens have to be indicated on a food
checking the label if you or a person you're cooking for suffers from an allergy.

Allergens that have to be indicated on a food label b			
Celery (stalks, seeds, leaves and roots)	Cereals containing gluten (wheat, barley, rye)	Crustaceans (crabs, lobster, scampi, prawns)	Molluscs (oysters, snails, mussels, squid)
Eggs	Flour (flour and seeds are often found in bread)	Milk	Mustard (liquid, powdered, seeds)
Peanuts	Tree nuts (almonds, Brazil nuts, pecans, cashews, hazelnuts, walnuts)	Sesame seeds	Soya

Research

Research how peanuts are grown to see why they are listed separately from tr

Apply

Find a recipe for a fish pie and modify it to meet the requirements of:

- a person who is allergic to milk
- a coeliac

Resear

Research pr
eggs in recip
to eggs.

Did you know?

A nut allergy is among the most common allergies in the UK – approximately 1
from an allergy to peanuts, and around 0.5% suffer fr allergy to tree nuts
of them grow out of the allergy and can safely at ut nd peanuts during ad

When preparing, cooking and serving dishes for people with nut allergies, you
to the label, as even a small amount of nuts can cause anaphylactic shock. Re

- pea te, almond butter or any type of nut butter
- waln , almond oil or any type of nut oil
- spreads such as Nutella®
- some biscuits, ice creams, chocolate, cereal bars and breakfast cereals
- Chinese, Indonesian and Thai dishes, as they are often made using peanu (groundnut oil)
- certain sausages, e.g. mortadella
- bread and other baked goods

High-fibre diet

Dietary fibre is an important part of a healthy balanced diet. It can be applied to
reduces the risk of bowel cancer, atherosclerosis, diverticulitis, type 2 diabetes a
recommended to increase the intake of fibre on low-calorie, weight-loss diets.

Dietary fibre can be divided into two groups – soluble and insoluble fibre.

	Function	S
Soluble fibre (pectin)	Lowers blood sugar level, prevents diabetes and hyperglycaemia, gives the feeling of ful	Most frui vegetable apples, b carrots) c beans an
Insoluble fibre (cellulose)	es regular bowel movements, cleans the bowel from the inside, protects from toxins, prevents constipation, lowers the risk of bowel and breast cancer	Whole gr and nuts, other drie vegetable root vege fruits

The function and source of soluble and insoluble dietary fib

To avoid unpleasant effects, such as bloating, wind or constipation, it is necessary
drink plenty of water when eating a high-fibre diet. To remain healthy, teenager
adults should consume around 30 grams of fibre a day. Unfortunately, many peo
not meet these requirements.

It is also recommended to be physically active to promote healthy bowel movem
remain healthy and maintain proper body weight.

Apply

Choose a main dish recipe and adjust it to the dietary requirements of: vegetarians, the elderly and diabetics. Justify your choice and list the ingredients that require replacement.

High-energy needs

Some people may require more energy due to their occupation or very high leve
physical activity. When planning diets for them, it is important to know the caus
their increased requirements.

In athletes, such as marathon runners, high energy needs are caused by high aer
physical activity. Marathon runners need a lot of energy to last the distance req
diet for marathon runners is rich in carbohydrates, as they are most easily u
the body and provide energy throughout the whole run. Lack of carbohydrates c
to production of lactic acid in the muscles, which, in turn, would lower their effe
and stamina. When preparing for a run, a marathon runner should provide betw
and 70% of their total energy intake from carbohydrates. As a result, the liver an
muscles can accumulate a sufficient amount of glycogen to be used during the ru
proteins are important, as they are necessary to repair muscles damaged during
A marathon runner should eat up to 1.8 g of protein per kilogram of body mass a

In professional swimmers, high energy expenditure is the effect of low water ten
compensate and produce a huge amount of energy to keep their body temperat
usually based on carbohydrates and must be easy to digest – a large amount of f
overburden the stomach and cause health issues, such as indigestion or heartbu
protein to repair and build the muscles, and polyunsaturated fatty acids to provi
thermogenesis (production of warmth).

Did yo

The diet of th
Phelps provid

In weightlifti muscle activity is short, but very intense – they must lift very heavy objects in a matter of seconds. For this reason, their muscles need to be strong and be able to regenerate quickly. In fact, the energy is derived from ATP and phosphocreatine, which can provide energy even faster than glucose. Their muscles also must remain highly reactive for nervous impulses, and for this reason it is important to maintain high levels of substances which increase their reaction time (e.g. caffeine). As the muscles are exposed to heavy weights, they can be damaged easily – for this reason, weightlifters must provide with their die substances which will support regeneration. A weightlifter's diet is, therefore, very high in protein (up to 2 g per kilogram of body mass) and carbohydrates.

Also, some diseases can require a higher calorie intake due to the pathological process they induce. For example, high-calorie diets are recommended for peop nervosa, cystic fibrosis, pancreatitis and certain forms of cancer.

Religious beliefs

Different religions affect people's food choices in different ways. They usually ha number of occasions which are celebrated in a specific way. Many religions stat for their followers – in the past, this was often dictated by the climate and health eaten as it could carry parasites (little worms which can cause diseases). Today, which were established a long time ago.

So, how can religion affect people's food choices?

- It can state a list of allowed and forbidden fo
- It can establish holidays during which al tive food is eaten.
- It can dictate fasting period
- It can determine th meals.

The table below shows how dietary rules differ in Hinduism, Islam and Judaism.

	Allowed and forbidden foods	Holidays	Fasting peri
Hinduism	• Beef cannot be eaten • Many Hindus are vegetarian • In certain types of Hinduism, consumption of eggs is also forbidden • Also, onion, garlic and alcohol are forbidden	Holi, Diwali	In different varie Hinduism people on either Monda Thursdays or Saturdays. nine days of fast take place durin Navaratri.
Islam	• Only halal foods can be eaten • Animals have to be slaughtered in a special way • Pork and alcohol are strictly forbidden • Also, blood cannot be eaten – during slaughter, blood is completely drained from the carcass	Eid al-Fitr (feast celebrating the end of Ramadan), Tashriq	Ramadan is a mo long fasting peri when, during th Muslims cannot drink or generall anything in thei mouth. Muslims can also choose to fast o Mondays and Thursdays every of the year.
Judaism	• Only kosher foods can be eaten • Animals are killed in a special ritual • Pork and shellfish are forbidden • meat and dairy cannot be eaten, or even stored, together	Rosh Hashanah, Passover	Yom Kippur – inv fasting for 25 ho (from dawn to d the next day) Tisha B'Av

As you can see, the dietary requirements of religions differ more or less significa meal or a diet for Muslim, Jew or Hi[illegible] need to take into account the foods shopping, you also need to [illegible]tion to whether the food was produced in a it has to be labelled [illegible] and for Jews it needs to be kosher.

Apply

Look up a traditional Scottish breal it is suitable for Hindus, Muslims an

Check your understanding: Nutritional and different groups of people

1. Which one of the following has to be avoided by a coeliac? *(1 mark)*

   a. rice ☐ c. amaranth
   b. barley ☐ d. buckwheat

2. Which one of the following has to be supplemented by a weight lifter?

   a. carbohydrates ☐ c. protein
   b. fats ☐ d. sugars

3. Prevention of rickets in children involves *(1 mark)*

   a. high consumption of vitamin D and magnesium ☐
   b. high consumption of vitamin D and calcium ☐
   c. limited consumption of vitamin D and magnesium ☐
   d. limited consumption of vitamin D and calcium ☐

4. List 2 nutrients required by teenagers in higher amounts, and give o

Nutrient	

5. Explain two changes in a diet for adults to prevent diet-related disease

   1. .....
   .....
   .....

   2. .....
   .....
   .....

6. Evaluate the impact of a vegan diet on health. (*6 marks*)

.....
.....
.....
.....
.....
.....
.....

Major diet-related health i

An imbalanced diet can cause many different health conditions. Some of them a
diet only, while some are more serious and might require medical attention. In t
the current biggest public health issues in the UK, and how to modify the diet to
help alleviate symptoms.

Obesity

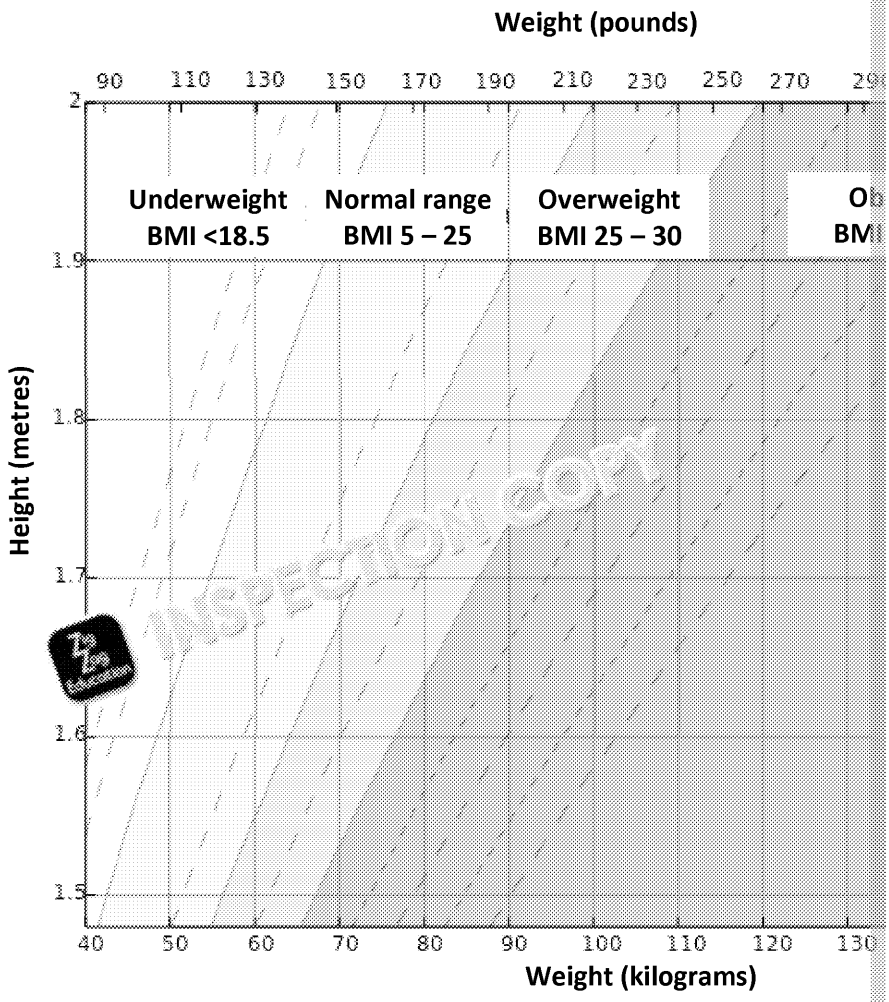
Obesity and overweight are the most common conditions in British society. Sadly
suffer from obesity, and the number is still growing – it is predicted that over 70%
overweight or obese by 2034. Nearly 32% of children suffer from either overweig
2015). Childhood obesity is a special concern since it is known that obese childre
obese adults.

Overweight and obesity can be easily judged using the body mass index.

Body mass index = body mass in kilograms / height in

BMI < 18.5	Underweight
18.51–25.0	Normal body weight
25.01–29.9	Overweight
>30.0	Obese

You can also observe how the BMI is shaped for people of different height and w



What are the causes?	• eating too much • little or no physical activity • hormonal disorders • some medication
What are the effects?	• increased risk of developing glucose intolerance, insu type 2 diabetes • increased risk of heart failure and other cardiovascul • increased blood cholesterol levels • joint and back pains • depression, social isolation
How do nutritional needs change?	• decrease in energy int • increase in mic or itri intake • incr ph activity • incre in dietary fibre

Apply

Modify the recipe for traditional fish and chips to meet the needs of an obese p
amend both the ingredients and the cooking methods.

Cardiovascular health

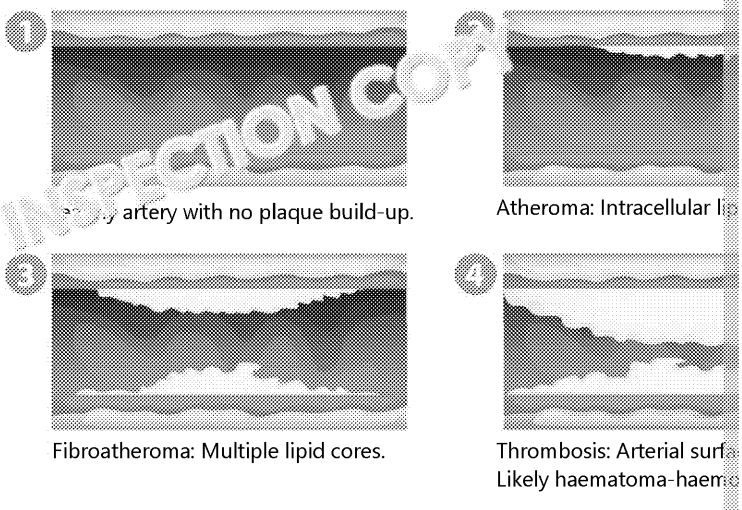
Nutrition has a huge impact on the proper performance of cardiovascular system
lack of physical activity, increases the risk of atherosclerosis, heart attack or stro

Too much cholesterol	Atherosclerosis, Coronary Heart D
Too much salt	High blood pressure (hypertension
Too little vitamins	Weak blood vessels, bruises and v

Examples of how food affects cardiovascular system

Atherosclerosis is a condition where cholesterol plaque accumulates on blood ve
to stiffen and narrow. In advanced atherosclerosis the plaque can close the ves
most dangerous are those in the brain and heart, because they may irreversibly d
sudden death.

Arteriosclerotic Vascular Disease (Atherosclero



If the plaque mostly accumulates in the veins of the heart, it may cause chest pai
This condition is called **coronary heart disease (CHD)** and is a serious condition th
common in men than women, and in people over 50 than younger people. Since
every year in the UK alone, it is best to closely monitor and treat it as soon as pos
daily aspirin intake and changing diet.

Increase	
Physical activity	Amount of total fat, sa consumed
Amount of fibre consumed	Amount of energy con
Amount of polysaccharides & whole grains consumed	Amount of sugars cons
Amount of antioxidants consumed	Give up smoking
Omega-3 fatty acids (from fish and fish oil)	Lose weight

Changes in diet to reduce atherosclerosis and coronary heart disea

Another condition that affects the cardiovascular system is high blood pressure.
of sodium – due to either improper diet or kidney issues. A normal person's bloo
around 120/80 mm Hg – the lower number being an indicator of blood pressure w
the higher when it is contracted. If these numbers are higher than 140/90 mm Hg
Untreated hypertension can trigger an avalanche of health issues:

- damage to the heart, brain, kidneys and eyes
- increased risk of heart failure and stroke
- can lead to kidney failure
- can lead to premature death

The main symptoms of hypertension include sweatiness, dizziness, trouble breath
pitched noises in your ear), speedy heartbeat and problems sleeping. Changes in
and undo the negative effects of hypertension.

Increase	De
Vitamin C, calcium- and potassium-rich foods	Salt
Amount of garlic consumed	Salty snacks, meats and
Fresh food	Ready-to-eat foods and
Whole grains and fibre-rich food	Coffee and alcohol
Physical activity	Processed food

Changes in diet to reduce hypertension

Things to think about

Discuss the different ways of lowering fat and salt intake in a diet.

It may be worth remembering that omega-3 fatty acids and phytosterols (substan
way to cholesterol and are naturally present in some plant foods) may help to low
decrease the levels of low-density cholesterol (LDL), increase the levels of high-de
to minimise the risk of cardiovascular disease.

You can learn more about omega-3 fatty acids in the Course Companion for Area
about phytosterols in the Course Companion for Area 5 – Where food comes fro

High cholesterol

This mysterious name is used for a condition in which blood cholesterol levels ar
forms of cholesterol in the body: high-density cholesterol (HDL) which is known a
density cholesterol (LDL) which is known as 'bad' cholesterol. Although both of t
increased levels of the latter can cause various health issues.

Increased LDL levels in the blood are usually an effect of imbalanced diet or obes
genetic diseases.

As you already have learnt in this section, cholesterol can form plaque and accum
them to narrow and stiffen – this is known as atherosclerosis. High HDL levels ca
If someone is diagnosed with high cholesterol levels, they should consider the fol

- include a large amount of fresh vegetables and fruit
- increase their consumption of [illegible]
- lower their consumption of total fat, saturated fat and trans fat
- try to introduce more phytosterols, e.g. from plants, or from specially produ
  beverages
- increase their consumption of omega-3 fatty acids, as they help to protect t
  LDL levels
- give up smoking
- increase their physical activity

Research

Find three foods which provide omega-3 fatty acids and phytosterols in a diet.

Type 2 diabetes

Diabetes mellitus, or **type 2 diabetes**, is one of the most common chronic diseas affects nearly 60 million people in Europe, and is rapidly growing. Diabetes is pri performance of a hormone produced by the pancreas – insulin. Insulin helps tra If it works incorrectly, or there is not enough insulin, the blood sugar level grows blood and attack cells and tissues, not knowing how to enter them. This has a tr the body organs.

What are the causes?	• improper performance or amount of insulin • obesity and overweight • lack of physical activity • unbalanced, high sugar and high-fat diet • lack of [illegible] fibre
What are the effects?	• blindness (diabetic retinopathy) – sugar damage • heart attack • kidney failure (diabetic nephropathy) – sugar da vessels in the kidneys • stroke • limb amputations (diabetic neuropathy) – sugar limbs, leading to lesions, which, if untreated, m serious conditions that require a limb amputati • pregnancy complications –for both the mother
How do nutritional needs change?	• a balanced diet has to be provided • five or six meals a day • limited amount of sugar (ideally none) • weight loss • increase physical activity

Research

Find out more about diabetes on **zzed.uk/8251-idf**

Apply

Plan a daily menu for a 65-year-old woman suffering from obesity and type 2 diabetes.

List the products that sho[illegible] used.

List [illegible] th[illegible] rules that the menu shou[illegible]w. These can include cooking techniques, choice of ingredients or dietary supplements.

Apply

Plan a daily [illegible] man sufferin[illegible] hypertensio[illegible]

List the pro[illegible] used.

List at least [illegible] should follo[illegible] cooking tec[illegible] ingredients [illegible]

Bone health

Bones require calcium, phosphorus and vitamin D to remain healthy and strong. Lack of any of these micronutrients can lead to either **rickets** (in children) or **osteoporosis** (in adults). These diseases are characterised by soft, easy-to-break bones, which also heal slowly and don't grow properly, and this affects body posture and ability to move.

What are the causes?	• too little vitamin D • too little calcium • too much phosphorus
What are the effects?	• soft and brittle bones • breaks and fractures of the bones • prolonged healing of the fractures • improper growth of the bones • improper body posture • impaired ability to move
How do nutritional needs change?	• increase in vitamin D • increase in calcium • increased consumption of milk, dairy, nuts and fi • decreased need for phosphorus (because it impa

Did you know?

Many adults suffer from lactose intolerance, and for that reason the calcium in their diet cannot be provided by milk or dairy products.

Apply

Using the source provid
plan two calcium-rich m
dairy-free.

Apply

The latest recommendations for free sugars intake state that it should provide les
energy intake. Plan a daily diet for a teenager to meet these recommendations.

Rese

Find out about non-dairy, calcium-rich foods at **zzed.uk/8251-calcium**

Dental caries

Teeth, just like bones, need calcium, phosphorus and vitamin D to grow properly strengthen the enamel, which protects the teeth from bacteria and acids.

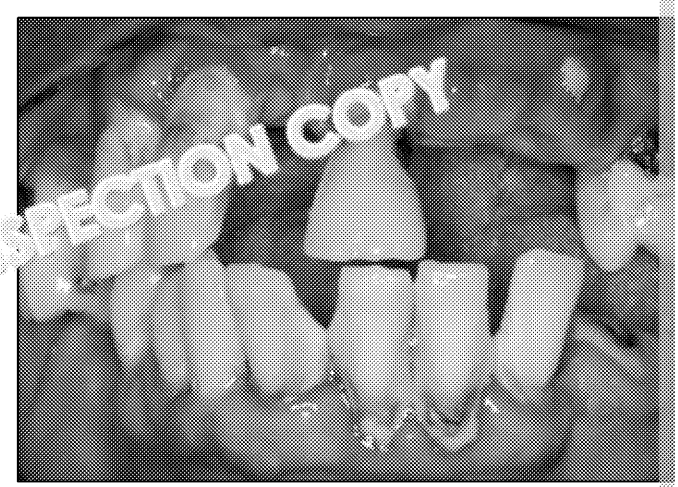
Bacteria in the mouth accumulate on teeth and form plaque. They then transfor which damage the enamel and cause tooth decay and premature tooth loss. To p their teeth at least twice a day, and use mouthwash and dental floss. Yearly che also recommended to ensure that everything is okay or to spot and treat any pro avoid further damage.

Remember that too much fluoride is also harmful, as it caus the tooth enamel damage.

What are the cau	...te vitamin D, calcium and phosphorus • too little or too much fluoride • too much sugar in the diet • improper dental hygiene
What are the effects?	• tooth decay • tooth loss • brittle, fragile enamel
How do nutritional needs change?	• increase consumption of milk, dairy, nuts and fi • carry out a proper dental hygiene routine • avoid sugar and sugary foods and beverages

Apply

Plan a daily meal plan for a six-year-old to support their dental health. Rememb to the age of your consumers.



Advanced dental plaque and dental caries

Iron deficiency anaemia

Iron plays a crucial role in building haemoglobin – the colourful compound of red
to the tissues all around the body. If there is not enough iron, red blood cells ca
anaemia (literally 'lack of blood'). Iron deficiency isn't usually dangerous, but ma
of life. Untreated anaemia can lead to loss of immunity and higher susceptibility
increase the risk of certain complications during and after birth in pregnant wom

Iron occurs in foods in two forms: haem iron (in animal-derived foods) and non-h
Haem iron is built the same way as the iron in our bodies, and, therefore, it is ab
than non-haem iron. Nevertheless, iron absorption can be increased by vitamin C
served with a salad!

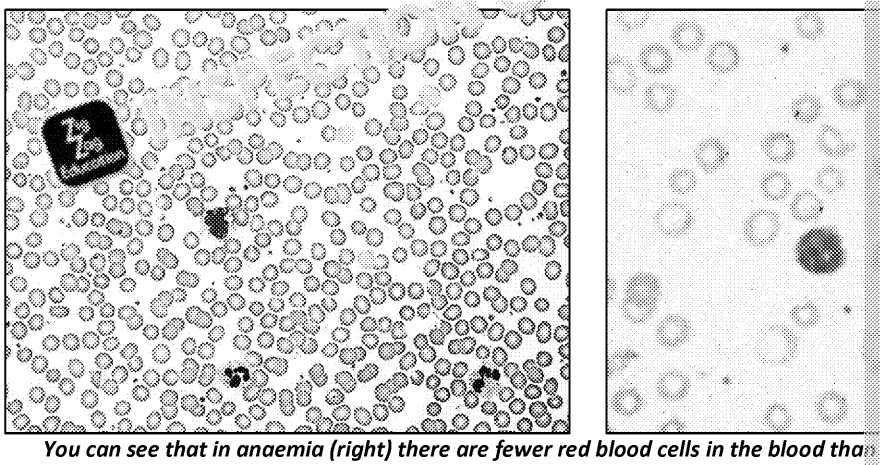
What are the cause	poor intake of iron too little vitamin C
What are the effects?	• pale complexion (skin colour) • tiredness • speedy, accelerated heartbeat • shortness (lack) of breath • hair loss
How do nutritional needs change?	• increase consumption of iron-rich foods such as • eat more leafy green vegetables such as spinach • choose iron-fortified products such as cereals, f • eat more fruits and vegetables to improve iron a

Did you know?

Teenage girls and women of childbearing age are at higher risk of developing iron deficiency anaemia due to blood loss caused by menstruation and childbirth.

Apply

Plan a d
teenage
the iron



You can see that in anaemia (right) there are fewer red blood cells in the blood tha

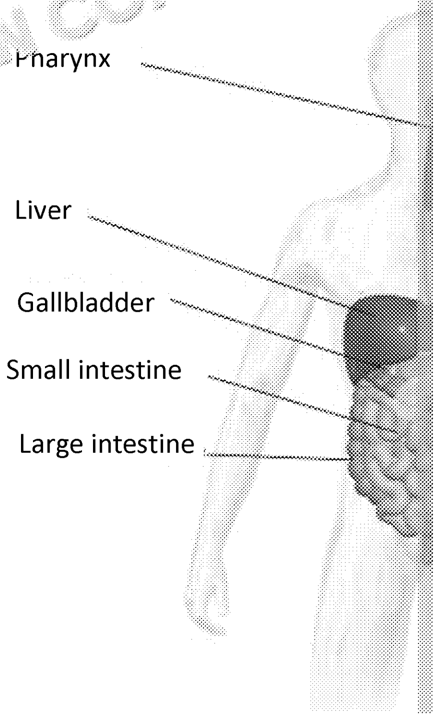
Liver disease

The liver is one of the largest organs in the body and it performs multiple functio

- it produces bile and supports fat absorption
- it produces certain proteins
- it produces lipoproteins (e.g. HDL and LDL) which transport cholesterol arou
- it stores glucose in the form of glycogen
- it stores iron and processes haemoglobin from old or damaged red blood ce
- it produces urea, which is then removed through the kidneys
- it removes poisons and toxins from the body
- it regulates blood clotting
- … and many others

For this reason, the liver is exposed to various toxic and poisonous substances which can damage it. There are many different forms of liver disease, but the most common ones include:

- alcohol-related liver disease – caused by chronic high consumption of alcohol
- non-alcoholic liver disease – usually develops in response to an unbalanced diet, e.g. in obesity
- hepatitis – caused by viruses (type A virus spreads through contaminated food and water, while type B and C viruses spread through blood)



The liver is located to the right o
gall bladder – the liver produc
From the gall bladder, the bile
where it suppo

As liver disease develops over several years without any symptoms, it can cause cirrhosis, or irreversible scarring, of the liver. The liver cannot perform its functions any more, and, therefore, people with cirrhosis may require a liver transplant.

If someone is diagnosed with liver disease, it is important that they introduce certain modifications in their diet:

- quit drinking alcohol, as it only worsens the situation and overburdens the li
- base the diet on starchy carbohydrates
- limit the amount of fats – they are processed in the liver so they put extra st
- control the consumption of protein – in mild liver disease it shouldn't be hig mass, but in advanced liver disease an acceptable protein intake may be m
- avoid potentially poisonous food, such as mushrooms and some plants and
- try to increase calorie intake
- eat regular small meals (even up to eight a day!)
- limit consumption of salt – sometimes liver disease results in swelling and w amount of salt helps to reduce it

Check your understanding: Major diet-rela

1. Which one of the following is crucial for maintaining dental health? *(1*
   a. vitamin K ☐ c. vitamin E
   b. washing fruits before eating ☐ d. toothpaste a

2. Which one of the following techniques is best for reducing the fat con
   a. frying ☐ c. boiling
   b. deep frying ☐ d. baking

3. Osteoporosis is most common a ng *(1 mark)*
   a. children ☐ c. adults
   b. teenagers ☐ d. elderly

4. nutrients necessary for dental health, and indicate one source

Nutrient	

5. Obesity is a risk factor of many health conditions and diseases. Identify

   1. .....

   2. .....

6. Evaluate the impact that diet has on the cardiovascular health of the B

.....

.....

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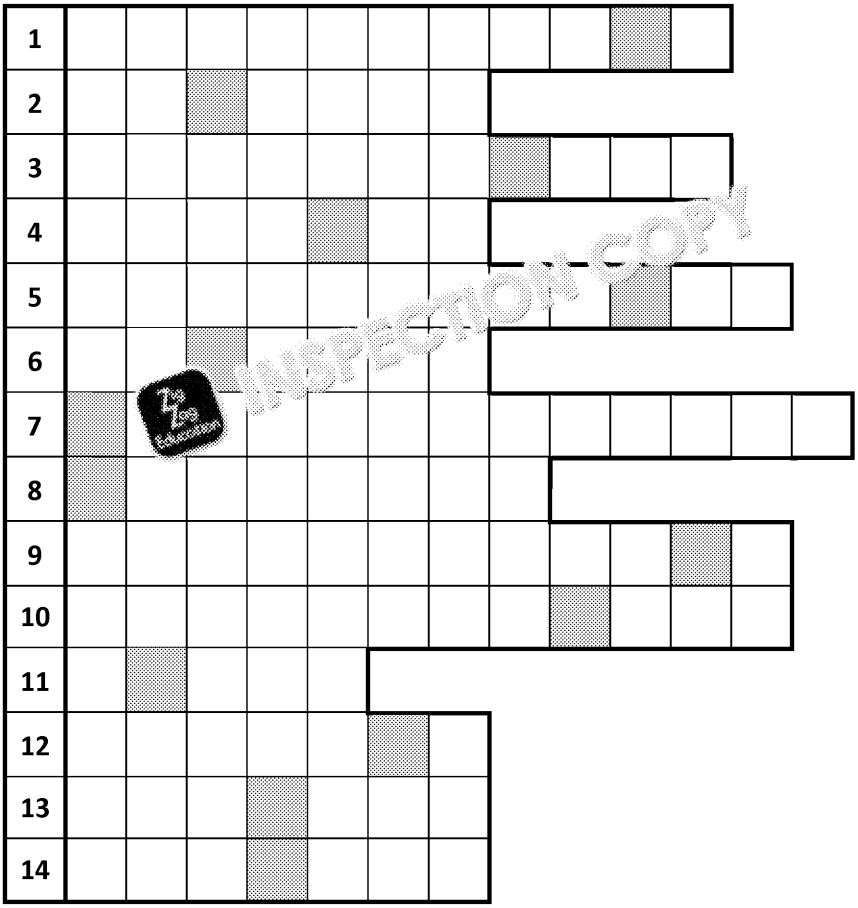
Quiz-ine

Fill in the answers to the questions below to reveal a word relevant to diet and g
squares.



1. Inability of the digestive system to digest certain foods, e.g. lactose. (11)
2. Macronutrient supplemented in a diet for weightlifters to support muscle re
3. High levels of this substance can cause atherosclerosis. (11)
4. A child aged between one and three years old. (7)
5. A condition caused by an inadequate or unbalanced diet. (12)
6. Health condition caused by iron deficiency. (7)
7. Macronutrient that constitutes up to 70% of a marathon runner's diet. (13)
8. Condition in which blood sugar levels are elevated. (8)
9. Brittle bone disease often associated with the elderl (12)
10. Cardiovascular condition caused by high sodi nt e. (12)
11. A person who doesn't eat any produ nimal origin. (5)
12. A month-long fasting period in is a (7)
13. A term given when B is higher than 30 kg/m^2. (7)
14. A reacti th ne system to a food or other factor, e.g. nuts. (7)

The shaded squares reveal these words:

_ _ _ _ _ _ _ _ _ _ _ _ _

Energy requirements of individuals

Check your understanding

1) D **2)** D **3)** C (1 mark for each correct, max. 3 marks)

4) 1 mark for each correct from: (1 mark for each correct, max. 4 marks)
- height
- weight
- age
- sex

Do NOT accept 'gender' instead of 'sex', as these are different categories and sho

5) Indicative content: (1 mark for the re… mark for a relevant explanation, ma
- **Reason:** This is because the … Benedict equation is based on the sex, a individual. These … proportionate in adults, but not in children.
- **Explanati…** children have a small body size, but their energy requiremen… g… mo… velopment; also, the ratio between their body surface area a… m… that they lose warmth easily and need extra energy to keep thems… Benedict equation to calculate their energy needs would result in very smal… these could easily cause the children to starve.

6) Any three from: (1 mark for each correct, with or without description, max. 3 ma
- Physical activity helps to increase the amount of muscle tissue in the body. weight can increase due to the larger amount of muscle tissue in the body.
- Physical activity helps to use the energy stored in the adipose (fatty) tissue, loss.
- Physical activity can lead to a change in body composition – there will be m… tissue.
- Physical activity lowers the risk of cardiovascular disease / hypertension / … disease.
- Physical activity lowers the risk of obesity/overweight.
- Physical activity lowers the risk of type 2 diabetes.
- Or any other relevant answer.

How to plan balanced diet

Things to think about (p. 12)

There are a few common points between the two guidelines.

Similarities:
- both stress the importance of starchy foods, vegetables and fruit in the diet
- both underline the role of hydration in maintaining health
- both point out the importance of food labelling, e.g. in the form of traffic light sy…

Differences:
- the eight tips for healthy eating also include guidan… ph…sical activity, whicl… healthy lifestyle
- the eight tips also point out the im… fish for a healthy diet
- the eight tips also pay attenti… breakfast as the most important meal of the d…

In general, students sh… e that the Eatwell Guide refers mainly to the five grou… more gener… pp… to other aspects of nutrition.

Things to think about (p. 15)

- Lowering the amount of fat can help to prevent overweight and obesity, and to
  coronary heart disease, type 2 diabetes, and even digestive issues (e.g. stomach
  the liver.
- Substituting sugar with xylitol helps to lower the risk of obesity and type 2 diab
- Substituting whole milk with skimmed milk lowers the total fat intake in the die
- Grilling can help to lower the total calorie/fat intake.
- Increasing the amount of fibre helps to prevent constipation, diarrhoea, diverti
  lowers the risk of type 2 diabetes and obesity.
- Lowering the amount of salt helps to reduce the risk of hypertension.

Check your understanding

1) C **2)** A **3)** B (1 mark for each correct, max. 3 marks)

4) 1 mark for each correctly identified mineral and vitami ax. 2 marks)
1 mark for each correctly identified function for se nineral/vitamin (max. 2
Students MUST identify one mineral and v Only one function for eac

	Name	Function
Vitamins	Vitamin A (in	Functions include supporting healthy eyesi
	Vi B1 (thiamine)	Functions include helping to release energy nervous system.
	Vitamin B2 (riboflavin)	Functions include helping to release energy mucous membranes and the nervous syste
	Vitamin B3 (niacin)	Functions include helping to release energy improve blood circulation and alleviate infl
	Vitamin B9 (folic acid)	Functions include supporting production of spina bifida disease in newborns.
	Vitamin C (ascorbic acid)	Functions include improving absorption of tissue and boosting immunity.
Minerals	Iron (non-haem)	Functions include building haemoglobin and t
	Potassium	Functions include maintaining a healthy blo
	Phosphorus	Functions include building healthy bones a and energy production.
	Fluoride (depending on the soil quality)	Functions include strengthening the teeth, l preventing dental caries.
	Calcium	Functions include building healthy bones a pressure, and sending impulses in the musc

Other suitable answers may be accepted.

5) Any two from: (1 mark for each correct, max. 2 marks)

- To lower the risk of coronary heart disease
- To lower the risk of obesity
- To lower the risk of type 2 diabetes
- To reduce the risk of atherosclerosis
- To reduce the
- To reduce the
- Or any other s

6) Any five from: (1 mark for each correct, max. 5 ma

- Starchy foods are a source of cor rb ydrates.
- Both dietary guidelines (t a l Guide and the eight tips for healthy ea basic component o a ed diet.
- Starch fo provide around 30% of a healthy, balanced diet; com al % daily energy requirements.
- Co carbohydrates are broken down in the digestive system into gluc which means that they are slowly released into the bloodstream and don't providing satiety for longer.
- Starchy foods are also a source of dietary fibre.
- Dietary fibre is necessary for a number of reasons: it helps to regulate bow constipation and diarrhoea, and helps to prevent bowel cancer and diverti
- Dietary fibre also helps to lower the blood sugar and cholesterol levels, hel and atherosclerosis / coronary heart disease.
- Starchy foods provide group B vitamins, especially thiamine, riboflavin, nia necessary for releasing energy from foods in the cells.
- Or any other suitable answer.

Check your understanding:

1) B **2)** C **3)** B (1 mark for each correct, max. 3 marks)

4) Any two from: (1 mark for each correct row, max. 2 marks); only one source for

Nutrient	Source
Calcium	Milk and dairy, leafy green vegetables, almonds and other n cereals, fish eaten with the bones
Vitamin D	Milk and dairy, egg yolk, oily fish and fish oil, fortified fat sp
Dietary fibre	Vegetables and fruit, cereals, whol l products
Iron	Red meat, poultry, liver, e g y lk, leafy green vegetables, d and cereals
Protein	Meat, p ltry fish, eggs, soya, quinoa, Quorn™, textured ve n ed by combining various plant foods such as c beans, etc.

Other s answers may be accepted.

5) Any two from: (1 mark for each change suggested, 1 mark for a relevant explana

Dietary change	Explanati
Limiting the energy/calorie content of food	Adults need less energy than younger peo more, and their level of physical activity is energy content of food helps to avoid over diseases related to them.
Limiting consumption of sugars	This can help to reduce the risk of develop
Limiting consumption of salt	This can help to reduce the risk of develop diseases (e.g. stroke).
Increasing consumption of milk and dairy, and oily fish	Milk, dairy products and fish are a source help to prevent osteoporosis in the elderly
Increasing consumption of iron-rich foods such as red meat, offal, eggs, leafy green vegetables, fortified foods	This may help to prevent iron deficiency a childbearing age.
Limiting consumption of saturated fats and trans fats, e.g. from fast foods, sweets, cakes, crisps, etc.	This may help to reduce the risk of obesity coronary heart disease, heart attack and s

Other suitable answers may be accepted.

6) The answer includes a reference to three from: (2 marks for each point describe description/simple statement, max. 6 marks)

- Vegans cannot eat any product of animal origin, e.g. fish, milk, eggs, dai lard. For this reason, a vegan diet can be lo in complete protein (unless it is complementation method is used) ir ir om plant foods is absorbed les vitamin B12 (it only occurs in nal ods), vitamin D (unless high exposure
- A vegan diet is very ri in ve ables and fruit. Vegetables and fruit are a s vitamins, vitan carotene, vitamin K and vitamin E.
- Hi su of dietary fibre is generally positive, as it helps to contro sa d prevents obesity, type 2 diabetes and high blood cholesterol le
- Ho er, if not enough water is drunk, high levels of fibre can lead to cons
- An unbalanced vegan diet can have various health consequences, such as i osteoporosis, pernicious anaemia and general malnutrition.
- On the other hand, a properly balanced vegan diet can bring various health

Other suitable answers may be accepted.

Things to think about (p. 33)

- Fat intake can be lowered by adjusting cooking methods (e.g. steaming, boiling, … or deep-frying). Fat intake can also be lowered by choosing lean meat, low-fat d… e.g. baked potato crisps instead of fried ones.
- Salt intake can be lowered, e.g. by preparing food at home, using fresh ingredien… products, limiting the use of tinned and canned foods, adding salt to food only a… with herbs and spices, etc.

Check your understanding

1) D **2)** C **3)** D (1 mark for each correct, max. 3 marks)

4) Any two from: (1 mark for each correct row, max. 2 mark…) the answer only ne… each nutrient.

Nutrient	Source
Calcium	…milk, …dairy products, almonds and other nuts, s… …ulse, fortified bread and cereals
Fluor…	Toothpaste and mouthwash, black tea, fluoridised … soil is fluoride-rich), fish
Vitamin D	Oily fish and fish oil, egg yolk, milk and dairy, forti… as a result of exposure to sunshine
Phosphorus	Milk and dairy, cereals, nuts and seeds, meat, fish

5) Any two from: (1 mark for each correct, max. 2 marks)

- glucose intolerance
- insulin resistance
- hyperglycaemia
- type 2 diabetes
- heart failure
- cardiovascular disease
- stroke
- coronary heart disease
- hypertension
- heart attack
- increased blood cholesterol l…
- joint and back pain
- depression
- or any other suitable answe…

6) The answer includes a reference to six from: (1 mark for each correct, max. 6 m…

- Diet provides nutrients, which are necessary to stay alive and maintain hea…
- Malnutrition can lead to many health complications, to include underweigh…
- If a person does not eat enough, he/she is likely to lose weight and develop … metabolic disorder, feeling weak, feeling cold and loss of fertility.
- If a person eats too much food in general, he/she is likely to gain weight an…
- Eating too much total fat / saturated fat / trans fat is a risk factor for cardio… hypertension.
- Eating too few omega-3 fatty acids affects the heart, while eating the corre… the heart.
- Eating too much sugar can lead to obesity, type 2 diabetes and tooth decay.
- High intake of saturated fat and sugar means that … energy excess will be … fat. This will also increase the amount of c…l ste…l in the blood.
- Cholesterol in the blood can bind … al… and other substances and fo… accumulate on blood vess… w…s.
- Cholesterol plaque … is called atherosclerosis and causes the blood … left untreat… …cause heart attack or stroke.
- H… su…ption of salt leads to hypertension. Hypertension can also lea…
- He…ack is one of the major causes of death in the British population. I… healthy, balanced diet and increasing physical activity.

Other correct examples can be accepted.

Quiz-ine

1. Intolerance
2. Protein
3. Cholesterol
4. Toddler
5. Malnutrition
6. Anaemia
7. Carbohydrates
8. Diabetes
9. Osteoporosis
10. Hypertension
11. Vegan
12. Ramadan
13. Obesity
14. Allergy

The shaded squares reveal the answer: **coeliac disease**