

Home learning activities

Subject
Science
Year Group
Year 8
Unit of work / Knowledge organiser
Healthy Diet - Revision
Activities
<ul style="list-style-type: none"> • Complete the 'Knowledge Check' by clicking on the link below (Mr Tobi has also emailed this link out to you): <p>https://forms.office.com/Pages/ResponsePage.aspx?id=tWqUKrjGMEuM3bZvypd0-1JR5WsjulFPvbjl4VXu0Y1UN0VIREZBQkJGN1IYT1FDN0tCNDhVTU9HSi4u</p> <ul style="list-style-type: none"> • Read through both pages of the 'Knowledge Organiser' on 'A Healthy Diet'. • Make careful and detailed notes on Sections 1-6, including writing out the 'Key Words', along with their definitions, from Section 1 and the 'Food Tests' from Section 3. • Write down, in your own words, the meaning of a 'vitamin deficiency' without looking at your earlier notes from Section 2. • Complete the 'Food Tests' exam-style question. Use the mark scheme (once you have tried the question) to mark your answers carefully. • Complete the 'Healthy Diet' exam-style question. Use the mark scheme (once you have tried the question) to mark your answers carefully.
Where do you complete the work?
In Study Books.
What to do if you finish the work? (Extension activity)
<ul style="list-style-type: none"> • Make sure you have completed the previous set work on 'Light - Revision' and then work on the 'Mini Project' on 'Healthy Diet'.

These websites might help:

- BBC Bitesize -> Secondary -> KS3 -> Science -> Biology -> Nutrition, Digestion and Excretion

If you are struggling with your work or if you have finished.

Please email your classroom teacher directly using the email list found in the Home Learning section of the website.

Year 8—A Healthy Diet

1. Balanced diet

A balanced diet is a diet in which all the components needed to maintain health are present in appropriate portions. A balanced diet should include appropriate portions of **carbohydrates, proteins, lipids, vitamins, minerals, water** and **fibre**.

Nutrient	Use in the body	Good sources
Carbohydrate	To provide energy	Cereals, bread, pasta, rice and potatoes
Protein	For growth and repair	Fish, meat, eggs, beans, pulses and dairy products
Fat	To provide energy. Also to store energy in the body and insulate it against the cold.	Butter, oil and nuts
Minerals	Needed in small amounts to maintain health	Salt, milk (for calcium) and liver (for iron)
Vitamins	Needed in small amounts to maintain health	Dairy foods, fruit, vegetables
Fibre	To provide roughage to help to keep the food moving through the gut	Vegetables, bran
Water	Needed for cells and body fluids	Fruit juice, milk, water

2. Deficiencies and eating disorders

If you have too little of a particular nutrient, we say that you have a deficiency in that nutrient. For example, fibre is needed to keep food moving through the intestines, people who have a fibre deficiency in their diet may get constipation.

Mineral deficiencies—we only need a small amount of minerals in our diet to stay healthy but a mineral deficiency can make you ill. For example an iron deficiency can cause anaemia, where there are too few red blood cells, where an iodine deficiency can cause a swelling in the neck called a goitre.

Vitamin deficiencies—again like minerals only a small amount of vitamins are needed in your diet to stay healthy, but you will become ill if you do not get enough. For example a vitamin A deficiency can cause blindness, vitamin C deficiency causes scurvy, which makes the gums bleed, and a vitamin D deficiency causes rickets, which makes the legs bow outwards in growing children.

3. Food tests

Food sample	Reagent	Method	Initial colour	Colour of positive result
Reducing sugar	Benedict's	Add Benedict's reagent to the food and boil in a water bath.	Blue	Brick red precipitate
Starch	Iodine	Add iodine reagent to the food.	Yellow-brown	Blue-black
Protein/amino acids	Biuret (a mixture of sodium hydroxide and copper sulfate).	Add Biuret reagent to the food.	Blue	Lilac/purple
Fat	Ethanol	Add ethanol to the food to dissolve the fat then add water.	Colourless	White emulsion

Year 8—A Healthy Diet

4. Eating disorders

An eating disorder is a mental illness. You will use food to try to manage your feelings. If you have an eating disorder you will have an unhealthy relationship with food. This may be eating too much or too little food. You may become obsessed with food and your eating patterns if you have an eating disorder.

Anyone can develop an eating disorder. It doesn't matter what your age, gender, cultural or racial background is. It is estimated that there are 725,000 people in the UK with an eating disorder.

Examples of eating disorders:

Bulimia Nervosa

Someone with bulimia nervosa (bulimia) will eat lots of food, but then make themselves sick to get rid of what they've eaten. Eating lots of food like this is called binge eating and then being sick afterwards is referred to as purging. People with bulimia may not look underweight and so may find it easier to hide their eating problems. Binge eating and vomiting can eventually do serious damage to the teeth, heart, kidneys and muscles, so it is a very serious condition.

Anorexia Nervosa

If someone has anorexia nervosa (anorexia), they will avoid eating and lose a lot of weight very quickly. They often feel fat, even when they are the opposite. They may use other ways of staying thin, such as taking tablets which make them go to the toilet more often or doing too much exercise.

5. BMI

Health workers use **body mass index (BMI)** to assess obesity. They measure the height and mass of a person and then use the equation below to calculate their BMI:

$$\text{BMI} = \text{mass (kg)} \div \text{height}^2 \text{ (m}^2\text{)}$$

For example, if a person has a mass of 60 kg and a height of 1.65 m:

$$\text{BMI} = 60 \text{ kg} \div 1.65^2$$

$$\text{BMI} = 22 \text{ kg/m}^2$$

A person is overweight if their BMI is between 25 kg/m² and 30 kg/m². A person with a BMI over 30 kg/m² is said to be obese.

Therefore, the person in this example is not overweight or obese.

6. Exercise and heart rate

Heart rate = the speed at which the heart beats.

Muscles need energy to contract. While exercising, the muscles need additional energy as:

- the breathing rate and volume of each breath increases to bring more oxygen into the body and remove the carbon dioxide produced
- the heart rate increases, to supply the muscles with extra oxygen and remove the carbon dioxide produced

Food Tests – Exam-Style Question

An athlete decides to try a new type of protein drink after he exercises.

- (a) The athlete tests the protein drink to check it contains protein.

Which solution is used to test for protein in the drink?

Tick **one** box.

Benedict's

Biuret

Iodine

Universal indicator

(1)

- (b) What colour will the solution turn to if there is protein in the drink?

Tick **one** box.

Blue-black

Purple

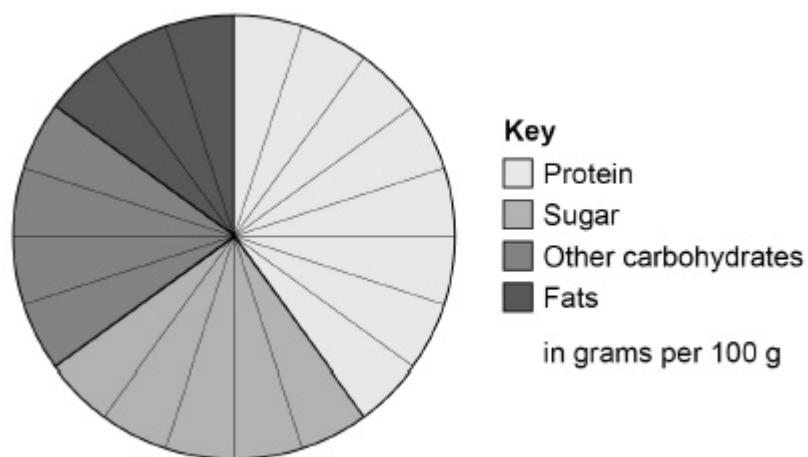
Red

Yellow

(1)

Figure 1 shows the proportion of different nutrients in the protein drink.

Figure 1



(c) What is the ratio of sugar to protein in the protein drink?

1:1 1:0:6 1:2 1:1:6

(1)

(d) Why is a high protein diet useful to an athlete?

Tick **one** box.

Provides amino acids to make new muscle.

Provides fatty acids to produce urea.

Provides glucose for energy.

Provides lactic acid for anaerobic respiration.

(1)

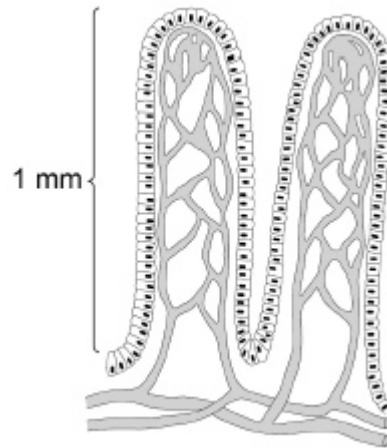
When the athlete drinks the protein drink the substances are digested.

The products of digestion are absorbed into the bloodstream.

Absorption happens in the small intestine.

Figure 2 shows a section of the small intestine.

Figure 2



- (e) How is the small intestine in **Figure 2** adapted to absorb the products of digestion quickly?

Tick **two** boxes.

It has a large surface area.

It has a long diffusion pathway.

It has a thin surface.

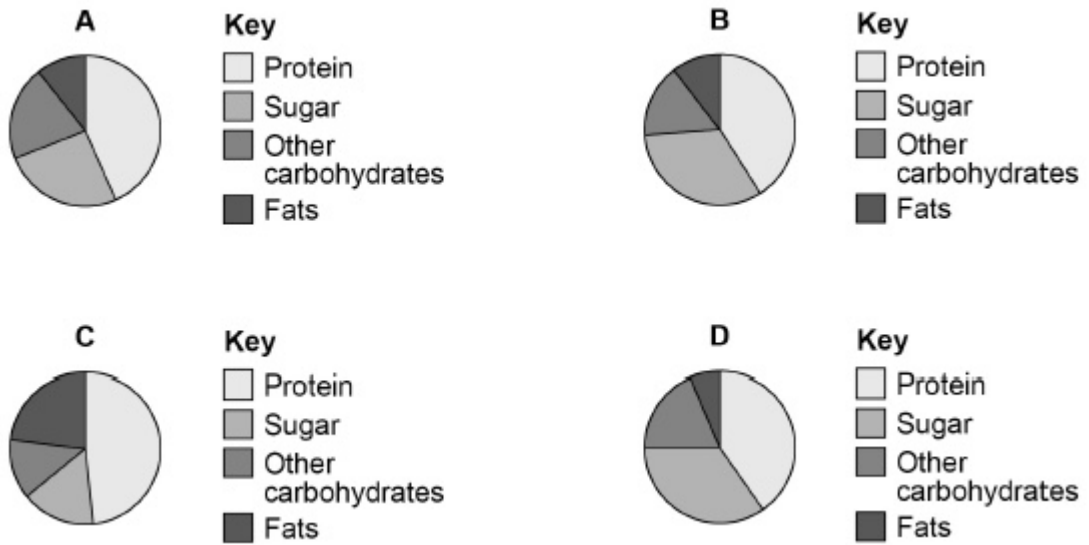
The concentration inside the small intestine is low.

It has a poor blood supply.

(2)

(f) **Figure 3** shows the proportion of different nutrients in four protein drinks.

Figure 3



Which protein drink should an athlete with diabetes use?

Give a reason for your answer.

Drink _____

Reason _____

(2)
(Total 8 marks)

Food Tests – Exam-Style Question – Answers

- (a) biuret 1
- (b) purple 1
- (c) 1:1.6 1
- (d) provides amino acids to make new muscle 1
- (e) it has a large surface area 1
it has a thin surface 1
- (f) **C** 1
lowest sugar (content) 1

[8]

Healthy Diet – Exam-Style Question

Table 1 gives information about 100 g of five different foods.

food	energy per 100 g of food (kJ)	nutrients per 100 g of each food			
		protein (g)	fat (g)	carbohydrate (g)	calcium (mg)
banana	403	1.2	0.3	23.2	6
wholemeal bread	914	9.2	2.5	41.6	54
butter	3031	0.5	81.7	0	15
cheese	1708	22.5	34.4	0.1	720
milk	275	3.2	3.9	4.8	115

Table 1

- (a) Look at **Table 1**.
- (i) Which of the four **nutrients**, protein, fat, carbohydrate or calcium, provides most of the energy in the cheese?

- (ii) Which of the four **nutrients** provides most of the energy in the wholemeal bread?

- (iii) Which of the four **nutrients** is needed for growth and repair?

3 marks

- (b) The recommended daily amount of protein for a woman is 45 g.
 Look at **Table 1**.
 How many grams of cheese would provide 45 g of protein?
 Tick the correct box.

50 g 100 g 150 g 200 g

1 mark

- (c) **Not** all the types of nutrients needed for a balanced diet are shown in **Table 1**.

Give the name of **one** of the missing types of nutrient.

.....

1 mark

- (d) **Table 2** shows the recommended daily amount of calcium for a person in four stages of the human life cycle.

We need calcium for healthy teeth and bones.

person	recommended daily amount of calcium (mg)
a baby aged 6 months	600
a woman before she is pregnant	500
a pregnant woman	1200
a breast-feeding woman	

Table 2

- (i) Use information in **Table 2** to estimate how much calcium a breast-feeding woman should have each day.

..... mg

- (ii) Explain why she would need this amount of calcium.

.....

.....

2 marks
maximum 7 marks

Healthy Diet – Exam-Style Question – Answers

- (a) (i) • fat 1 (L5)
- (ii) • carbohydrate 1 (L5)
- (iii) • protein 1 (L6)
- (b) any **one** from
- 200 g ✓
if more than one box is ticked, award no mark 1 (L6)
- (c) any **one** from
- vitamins
accept a named vitamin
 - water
 - fibre
accept 'roughage'
accept 'minerals' or a named mineral
*do **not** accept 'calcium'* 1 (L5)

- (d) (i) • 1100
accept a number from 1000 to 1300

1 (L6)

- (ii) any **one** from
- to make milk
 - milk contains calcium
 - a breast-fed baby needs calcium for growth **or** for bones **or** teeth
accept 'the baby needs calcium'
 - she has to have enough calcium for herself and the baby
accept 'to feed herself and the baby'
accept 'the baby needs 600 and she needs 500'
accept 'this is recommended for mother and baby'
'to feed the baby' is insufficient

1 (L6)

[7]

Healthy Diet

Watch this video: <https://www.youtube.com/watch?v=irdT9Av6ZPk>

Task	Description
1	Read through this website: 10 tips for a healthy diet Make your own leaflet saying advertising why we should eat healthily
2	Create a comic strip showing how food goes through the body.
3	Find the chemical formula for Glucose
4	How can obesity affect a person's life? Create a poster advertising the dangers of obesity
5	Write a newspaper article about the starvation of people in 3 rd World under developed countries. You must include research and the science of what can happen if you are malnourished.
6	Draw and label a diagram of the digestive system- label all the parts and explain their jobs
7	What are the 78 food groups and what are they used for?
8	What does the word malnourished mean?