

# CLIL MultiKey lesson plan

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## LESSON PLAN

**Subject:** Biology

**Topic:** Nutrition. Healthy food.

**Age of students:** 16-19.

**Language level:** B1+-B2

**Time:** 45 minutes

### **Lesson 1: Healthy lifestyle**

#### **Content aims:**

After completing the lesson, the students will be able to:

Explain what healthy lifestyle is.

Correlate Nutrition and Health.

Organise their ideas about healthy lifestyle in a spidergram or other graphic organiser.

Illustrate the importance of caring about health.

Prepare a Power Point presentation about healthy lifestyle.

Discuss about what to eat and why.

#### **Language aims:**

After completing the lesson, the students will be able to:

Use new vocabulary about nutrition and healthy lifestyle.

Give a short talk on healthy lifestyle.

**Vocabulary:** nutrition, malnutrition, nutritional value, consumption, over-consumption, excess calories, obesity, diet, dietary needs, deficiency, nourishment, imbalance, fuel, intake, weight-loss clinics, starvation.

**Pre-requisites:** Students have studied about nutrition and nutrients/digestion and digestive system.

**Necessary resources, materials:** Books: Biology. Visualising Life. Holt, 1996.; Biology for IGCSE, Mary Jones, Heinemann, paper for brainstorm activity. Internet connection, overhead projector.



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### Procedure steps:

1. **Teacher** suggests students (in pairs) to organise their ideas about healthy lifestyle in a spidergram or other graphic organiser.
2. **Students** tell about their suggestions. The rest of the students listen and add, if something is not mentioned, to their notes.
3. **A student** gives a Power Point **presentation** about healthy lifestyle\*. (previously prepared). (10-12 min.)
4. **Students** evaluate the presentation and ask questions to the presenter.
5. **The teacher** points out the topic for discussion- „Nutrition. Healthy eating.”
6. **Students** are offered a text „Nutrition: What You Eat and Why”. (Gap-filling language activity)\* (Handout 1)

### Handout 1:

1. Read and insert the missing words in the following text.

### Nutrition: What You Eat and Why.

#### Nutrition and Health.

Historically, protein, mineral, and vitamin deficiencies were significant nutritional problems in both developed 1. .... developing countries. Today, too much food (overconsumption) and 2. .... little physical activity are the two major factors leading 3. .... nutritional problems, although nutrient deficiencies still exist. Excess calories and fat lead to obesity and heart diseases. Excess fat 4. .... also been shown to increase the risk of breast and colon cancer. Too 5. .... protein harms the kidneys, and too much sodium is linked to high blood pressure. Too little fibre results 6. .... poor intestinal elimination and is linked to cancer of the large intestine (colon).

Nutrition is the science that studies how food affects the functions of living organisms. Proper nourishment is essential 7. .... healthy biological functioning. When the body does not receive the substances it needs, imbalances occur, biological processes are impaired, and diseases or death can result. Many of today's diets lead not only to inadequate nutrition 8. .... also to problems with digestion and elimination.

Essential nutrients are required for life.

Food contains nutrients. You need several types of nutrients in your diet. To obtain energy, your body uses carbohydrates, lipids and proteins as fuel nutrients. To regulate how your body uses energy 9. .... the fuel nutrients, your body needs water, minerals and vitamins, which do not provide energy. From these six essential nutrients, your body gets all it needs 10. .... order to grow, maintain and repair itself.

2. Arrange the nutrients in categories.

#### Essential nutrients

Fuel nutrients	Regulatory nutrients



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### Key for handout 1.

#### Nutrition and Health.

Historically, protein, mineral, and vitamin deficiencies were significant nutritional problems in both developed **1.and** developing countries. Today, too much food (overconsumption) and **2.too** little physical activity are the two major factors leading **3.to** nutritional problems, although nutrient deficiencies still exist. Excess calories and fat lead to obesity and heart diseases. Excess fat **4.has** also been shown to increase the risk of breast and colon cancer. Too **5.much** protein harms the kidneys, and too much sodium is linked to high blood pressure. Too little fibre results **6.in** poor intestinal elimination and is linked to cancer of the large intestine(colon).

Nutrition is the science that studies how food affects the functions of living organisms. Proper nourishment is essential **7.for** healthy biological functioning. When the body does not receive the substances it needs, imbalances occur, biological processes are impaired, and diseases or death can result. Many of today's diets lead not only to inadequate nutrition **8.but** also to problems with digestion and elimination.

Essential nutrients are required for life.

Food contains nutrients. You need several types of nutrients in your diet. To obtain energy, your body uses carbohydrates, lipids and proteins as fuel nutrients. To regulate how your body uses energy **9.from** the fuel nutrients, your body needs water, minerals and vitamins, which do not provide energy. From these six essential nutrients, your body gets all it needs **10.in** order to grow, maintain and repair itself.

2. Arrange the nutrients in categories.

#### Essential nutrients

Fuel nutrients	Regulatory nutrients
carbohydrates	water
protein	minerals
fats	vitamins

#### Handout 2.

#### Put the phrases in the correct order to make sentences.

1. for growth/ repair and reproduction/ we eat / to provide energy needed/ nutrition is the study of/ from the food/ how the body uses the nutrients
2. carbohydrates, proteins/ we get/ minerals and vitamins/ these nutrients from/ fat
3. our diet/ the foods/ make up/ every day/ we eat and drink
4. we need to eat/ to stay healthy/ nutrients/ the different kinds of/ a good balance

Key to handout 2.



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1.Nutrition is the study of how the body uses the nutrients from the food we eat to provide energy needed for growth, rapair and reproduction.

2.We get these nutrients from carbohydrates,proteins,fat, minerals and vitamins.

3.The foods we eat and drink every day make up our diet.

4.To stay healthy, we need to eat a good balance of the different kinds of nutrients.

7. **The teacher** checks the students' work.

### Lesson 2

**Subject:** Biology

**Topic:** Nutrition. Healthy food. Diets.

**Age:** 16-19 year olds

**Language level:** B1+-B2

**Time:** 45 minutes

#### **Content aims:**

After completing the lesson, the students will be able to:

List different nutrients.

Describe nutrient use in body.

Identify effects of insufficient use or overuse of some nutrients.

Discuss about what to eat and why.

#### **Language aims:**

After completing the lesson, the students will be able to:

Use new vocabulary about nutrition and healthy lifestyle.

Analyze what to eat and why.

1.**The teacher** offers the students a table about nutrients. Presentation about healthy food is ready made or prepared by a student.(Available on the site).



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Students watch a presentation and fill in the grids.(Handout 1).

Handout 1.

Nutrient	Use in body	Foods that contain it	Possible disorders in case of deficiency.
Carbohydrates	For energy	Bread, rice, potatoes	
Proteins			
Fats			
Vitamins			
Water			
Fibre			

2. The students are offered texts about the results of insufficient use or overuse of some nutrients. Students are divided in pairs, given more or less equal pieces of reading.(Handout 2). Students have to point out the main problems, so that the other students can write in their table.(Handout 1).

Handout 2.(May be cut in pieces)

(\*1.Many people **avoid carbohydrates** due to concerns about weight gain, but carbs are needed for the body to function. Carbohydrates are your body's main energy source and necessary for you to think and remain active. According to MayoClinic.com, carbohydrates should make up 45 to 65 percent of your daily caloric intake. Skimping too much on carbohydrates can cause several health problems.

### Hypoglycemia

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Hypoglycemia, also known as low blood sugar or low blood glucose, occurs when the glucose levels in the blood drop below normal. While hypoglycemia is often associated with diabetes, it can be caused by a lack of carbohydrates in healthy people. Symptoms of hypoglycemia include tiredness, weakness, light-headedness, confusion and hunger. Carbs are the main source of glucose because they are broken down into simple sugars during digestion and enter the cells with the help of insulin, providing energy. Eating a small amount of carbs will quickly treat hypoglycemia.

### Ketosis

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Eating less than 130 grams of carbohydrates a day can cause a buildup of ketones, which are partially broken-down fats in the blood. This condition is known as ketosis, according to the Weight-Control Information Network, a service of the National Institute of Diabetes and Digestive and Kidney Diseases. When your body doesn't have enough glucose for energy, it breaks down stored fat, producing ketones. Mild ketosis can cause mental fatigue, bad breath, nausea and a headache, but severe ketosis can lead to painful swelling of the joints and kidney stones. Aim for 225 to 325 grams of carbohydrates a day



### **\*2. Protein Deficiency Symptoms**

Protein deficiency can cause headaches.

Protein deficiency symptoms are the first signs that your diet may be lacking in complete proteins. When your body isn't getting the nutrition it needs to function well, it gives you signals that something is wrong. Pay attention to these symptoms and seek medical advice if you experience them.

#### Common Protein Deficiency Symptoms

Even with a wide variety of protein sources available, some people experience protein deficiency symptoms due to a lack of protein intake. Severely restrictive diets, lack of knowledge about nutrients, and even poverty can contribute to protein deficiency. Protein deficiency is nothing to fool around with either; deficiency can lead to gallstones, arthritis, and muscle deterioration, as well as heart problems. Here are some of the most common symptoms.

##### **Edema**

Edema is a collection of fluid under the skin, which most commonly affects the legs, feet, and ankles but can occur anywhere on the body. Protein is essential for maintaining a balance of water in your body; without it, you may store water improperly.

##### **Weight Loss**

Severe weight loss is one symptom of a protein deficiency. It may be attributed to muscle wastage, as your body breaks down your muscles in an attempt to get protein from them.

##### **Thinning or Brittle Hair**

Hair loss and thinning or brittle hair can also be caused by a protein deficiency. Hair is made up of protein, so a deficiency may lead your hair to lack the amount of protein it needs to stay healthy. If you become deficient enough, your hair will even begin to fall out.

##### **Ridges in Nails**

Ridges or white lines in both finger and toe nails can be caused by a lack of protein in the diet. Ridges that run from top to bottom on the nail can indicate an ongoing protein deficiency, while a ridge that runs transverse may indicate a deficiency that has now passed.

##### **Pale Skin**

Skin that loses pigment and burns more easily in the sun can be caused by a lack of iron, as well as protein. Frequently, foods that are rich in iron also contain protein, and protein is necessary for the body to utilize iron properly. Anemia or lack of iron may result in pale skin.

##### **Skin Rashes**

Skin rashes, which may be accompanied by dry or flaking skin are a symptom of a protein deficiency. These rashes are caused by extreme protein deficiency and may resemble eczema or other dry skin rashes.

##### **General Weakness**



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Weakness and lethargy may be caused by a lack of protein in the diet. Over time, as your stores of protein are depleted, your body will begin to break down muscle tissue, which can lead to a feeling of general weakness or lethargy.

### Slow Healing

Amino acids, the building blocks of protein, are crucial in wound healing. When your body heals itself, it needs to repair or produce tissues. These tissues use amino acids in the repairs, and a lack of protein can lead to a slower building process.

### Difficulty Sleeping

Difficulty in sleeping could be caused by a serotonin deficiency, which is caused by a lack of certain amino acids. These amino acids are produced when protein is broken down, and a diet with insufficient protein could lead to difficulty in sleeping.

### Headache

Headaches can be caused by many things, including a protein deficiency. A lack of protein may lead to headaches in one of a couple ways:

- By causing anemia
- By causing low blood sugar

### Fainting

Fainting and general weakness may be caused by a protein deficiency as well. This may be attributed to low blood sugar or to your body's need to break down muscle tissue to get the nutrients it needs.

### Other Symptoms

Not all of the symptoms of protein deficiency are physical. Some are emotional or mental, and include the following:

- Crankiness, moodiness
- Problems with conflict resolution
- Severe depression
- Anxiety
- Lack of energy, no desire to do thing

## 3. Fat deficiency.

You need at least a small amount of **fat** in your diet to provide the essential omega-3 and omega-6 fatty acids your body can't make and to help with the absorption of fat-soluble vitamins. If you don't get at least 15 percent of your calories from fat, you could develop an essential fatty acid deficiency or a deficiency of one or more of



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the fat-soluble vitamins A, D, E and K. An essential fatty acid deficiency can be corrected by getting more omega-3 and omega-6 fats in your diet, and the combination of fat and fat-soluble vitamins can resolve fat-soluble vitamin deficiencies.

### Fat-Soluble Vitamin Deficiencies

You can develop deficiencies of vitamins A, D, E and K if you don't get enough fat in your diet because your body can only absorb these nutrients in the presence of fat. Vitamin A deficiency symptoms can include dry skin, night blindness, increased susceptibility to infections and problems with bone and tooth development. Not absorbing enough vitamin D can cause soft and weak bones, and too little vitamin K can lead to increased bleeding

#### Skin Problems

You need the essential fatty acids for keeping your skin healthy, so not getting enough fat in your diet can cause skin problems. An essential fatty acid deficiency increases the loss of water from your skin, which results in a dry, scaly rash. This type of deficiency can also make it harder for your wounds to heal.

#### Cognitive Problems

Two types of omega-3 fatty acids, eicosapentaenoic acid and docosahexaenoic acid, are essential for brain development. Not getting enough DHA may result in learning deficits and increase the risk for certain types of dementia, including Alzheimer's disease. The omega-6 fat arachidonic acid is also an important component of brain tissue.

#### Vision Issues

EPA and DHA are also important components of the retina, so an essential fatty acid deficiency could affect your vision. DHA helps form the pigment rhodopsin, which you need for your brain to turn the light hitting your retina into the images you see. The retina can recycle and conserve DHA, however, so even low intakes of essential fatty acids may be enough to protect your vision. Getting enough omega-3 fats in your diet may help lower your risk for dry eyes and age-related macular degeneration, according to an article by optometrist Gary Heiting, O.D., on AllAboutVision.com.

### 4. Vitamin Deficiency

According to the WHO, a lack of **vitamin A** is the leading cause of preventable blindness in children. Pregnant women who are deficient in vitamin A have higher maternal mortality rates as well . Vitamin A is crucial for eye health and functioning, reproductive health in men and women, and also strengthening the immune system against infections. For newborn babies, the best source of vitamin A is breast milk. For everyone else, it is important to eat plenty of foods that are high in vitamin A, including green-yellow vegetables such as carrots, kale, broccoli, and sweet potatoes, or reddish-yellow fruits like apricots, papaya, and peaches.

Another common nutritional deficiency occurs with **vitamin B1**, also known as thiamine. **Thiamine** is essential for normal nerve function. Deficiency can lead to nerve and muscle damage and can affect the heart. A prolonged thiamine deficiency is also known as **beriberi**.

The disease of pirates: the grey-death. Scurvy is caused by a lack of **vitamin C**, whose chemical name, ascorbic acid, is derived from the Latin term for scurvy, *scorbutus*. Even though the disease was known since ancient times (described by Hippocrates around 400 BCE), it was not a scourge to those who were largely land-bound.





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Even though its causes were unknown, many cultures realized that eating certain herbs could reverse the symptoms, and as long as there was access to fresh food, it was generally kept under control.

**Vitamin D** is essential for healthy bones and helps the body maintain the right levels of calcium in order to regulate the development of teeth and bones. A lack of this nutrient can lead to stunted or defective bone growth. **Osteoporosis**, caused by a lack of calcium and vitamin D, can lead to porous and fragile bones that break very easily. It can often be asymptomatic (without symptoms). The best sources of vitamin D are sun exposure and foods such as cod liver oil, salmon, or dairy products that have been fortified with vitamin D. According to the National Institutes of Health's Office of Dietary Supplements, approximately 5-30 minutes of sun exposure twice a week can provide sufficient vitamin D.

### \*5. Calcium Deficiency

Calcium aids in the development of strong bones and teeth, and also helps the heart, nerves, and muscles function properly. A calcium deficiency often shows no immediate symptoms, but can lead to serious health problems over time. Calcium deficiencies are related to low bone mass, weakening of bones due to osteoporosis, convulsions, abnormal heart rhythms, or even death.

The best sources of calcium are dairy products such as milk, yogurt, and cheese; vegetables like kale and broccoli, and calcium-fortified cereals and grains.

**Iron-deficiency anemia** is the most common type of anemia, which occurs when your body does not have enough of the mineral iron. Your body needs iron to produce a protein called hemoglobin, which is responsible for carrying oxygen to your body's tissues. Your tissues and muscles need oxygen to function effectively.

### \*6.What are some diseases caused by a deficiency of water?

According to Healthy Place, a persistent deficiency of water can cause depression; chronic fatigue syndrome; insulin-dependent diabetes; lupus; multiple sclerosis; muscular dystrophy; amyotrophic lateral sclerosis, or ALS, otherwise known as Lou Gehrig's disease; Parkinson's disease; and Alzheimer's disease. A deficiency of water is also known as dehydration.

\*7.You can't really have a fiber deficiency, per se, since your body doesn't absorb it and there isn't a way to measure how much you have in your body. But it is possible to have too little fiber in your diet. When your fiber intake is lacking, you'll probably notice some gastrointestinal upset, and signs of a low-fiber diet may eventually show up during physical exam.)

**2.Students** read out about each nutrient, making up a complete sentence. (F.I.,Vitamins are necessary for..., You can find them in...; The deficiency of ... may result in...)

**3.Discussion about diets.** Teacher offers to discuss the problems of diets and dieting nowadays.

(Nowadays people are obsessed with diets.What are the reasons for it? Is it good or bad? What eating and other disorders can we have?(anorexia, bulimia, ulcer, kidney failure etc.)

Students discuss in small groups, then present their point of view. (Students should use their notes).



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### Lesson 3.

**Subject:** Biology

**Topic: Nutrition.** Healthy food.

**Age of students:** 16-19.

**Language level:** B1+-B2

**Time:** 40 minutes

#### Contents aims:

After completing the lesson, the students will be able to:

Explain the importance of caring about health since adolescence.

Describe health risks of eating unhealthy food.

Analyze what fat epidemic is.

Identify risks of dieting.

#### Language aims:

After completing the lesson, the students will be able to:

Use new vocabulary about nutrition and healthy food.

Express his or hers opinion about diets and dieting.

Procedure.

1. **The teacher** offers students a test (Handout 1) on nutrition. (Option: if the subject at school is optional, then the teacher can offer a discussion on diets. (Handout 2).

Handout 1. Test.

#### **Task I**

**Insert the words in the following sentences. Note, that there are more words than necessary. (5 points)**

*Nutrition, nutrients, nutritional, intake, digestion, deficiency, consumption, hydrochloric acid, enzymes, diet, dietary,.*



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1. When you are on ... you have to control everyday calories ... .
2. Proteins are different . Some of them are ... which help chemical reactions happen.
3. ... value of different products is different.
4. There has increased the ... of unhealthy food by children.
5. Fiber helps your ... process to take place at normal speed.
6. Keep in mind that you need all ... to stay healthy. ... of some can lead to disorders.
7. Mucus in your stomach helps your stomach walls not to be burned by ... .
8. ... of plants and animals is different.

### Key:

1. diet; intake 2. enzymes 3. nutritional 4. consumption 5. digestion 6. Nutrients; deficiency 7. hydrochloric acid 8. nutrition

### Task II

**Fill each of the numbered gaps in the following passage. Use only one word in each space. The task begins with an example (0). (10 points).**

#### GLOBAL OBESITY\*

The world has a wight problem. We are eating more junk food (0) and getting less exercise. The health risks are as enormous (1) ..... our waistlines.

How do we all get (2) ..... fat? The problem originates from the collision of (3) ..... number of modern trends: rising urbanisation, the fats growth of conveniences (4) ..... as cars, computers and television, and 21st century work culture , with its desk (5) ..... and long hours.

The fat epidemic is spreading (6) ..... richer to poorer parts of the world. In Brazil the poor used to fill up on beans, (7) ..... provided iron and protein. But mass movement to the cities has meant that people eat fewer meals at home; beans and rice have given (8) ..... to burgers and ice cream.

In many places, fruits and vegetables are far (9) ..... expensive than fats, sugar and meat; and Coca-Cola is cheaper than bottled water (10) ..... most of the world.

### Key:

1. as 2. so 3. a 4. such 5. work(s)/job(s) 6. from 7. which 8. way/place 9. more 10. in/over/across/throughout

### Task III

**Writing. Express your opinion about diets and dieting. Use some 150 words.**

(Content-5 points; vocabulary-5 points; accuracy-5 points).



## CLIL MultiKey lesson plan

**Model** for assessment.

### Assessment of a written piece of work (essay)

Criteria	Content (information)	Content (organization)	Language (vocabulary/terms and spelling)	Language (grammar)
Excellent  (5 points)	Content completely relevant to the topic. Arguments supplied by examples.	Clearly and logically arranged. Linkers are various and used successfully. Proportions observed.	Vocabulary is relevant to the topic. A wide repertoire of vocabulary and terms. No spelling mistakes.	No grammar mistakes except some (1-2) in articles
Good  (4 points)	The topic discussed successfully. One argument can lack support.	Clear layout. Link words used though some may be repeated.	Appropriate use of topic vocabulary. Inappropriate use of synonyms may occur. A few spelling mistakes(1-3)	Good grammar. Some mistakes (2-5) may be present.
Satisfactory  (2-3 points)	The attempt to discuss the topic has been made. Does not give enough arguments or aspects of the problem.	It is possible to follow the ideas.  Paragraphing may be wrong or absent. Proportions are not observed. Too long or short. ( The normal number of words +/- 10%)	Basic vocabulary is used. Vocabulary repertoire is limited. There are mistakes in using synonyms.	There are mistakes (6 -10) in structures, prepositions and verb forms. Some mistakes (1-2) are disturbing.
Unsatisfactory  (1 point)	The topic is not revealed or misunderstood.	Organisation is hard to follow or trace. Too short.	Inappropriate use of basic vocabulary. Sometimes (3and more cases) spelling disturbs understanding.	Mistakes prevent from understanding the content.

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Handout 2.

**Discussion about diets.** Teacher offers to discuss the problems of diets and dieting nowadays.

(Nowadays people are obsessed with diets. What are the reasons for it? Is it good or bad? What eating and other disorders can we have? (anorexia, bulimia, ulcer, kidney failure etc.)

Students discuss in small groups, then present their point of view. (Students should use their notes and new vocabulary).

