Generalizations: Science by Keith Kelly

AGE: Teenagers
LEVEL: Intermediate
TIME NEEDED: Approx. 90 minutes
OBJECTIVES: to examine essential nutritional items and the foods they come from and ask why humans need them for a healthy diet; describe nutritional items, their source and function; practise terms and phrases related to expressing generalizations.
KEY SKILLS: reading, speaking, writing, listening
MATERIALS: one copy of the worksheet per student; cards (one per pair) showing each food group (e.g. *protein*); dialogue cards (A and B) per pair of students

Content focus
Nutrition

Warm up: 5 minutes
Activity 1: 3 minutes
Activity 2: 10 minutes
Activity 3: 15 minutes
Activity 4: 15 minutes
Activity 5: 10 minutes
Activity 6: 25 minutes (could be homework)

WARM-UP

Ask the whole class to suggest foods we need for a balanced and healthy diet. Once the class has come up with a few examples, put students in small groups and give them 60 seconds to list as many as they can.

Ask the groups to feed back to the whole class. Students may offer examples of specific foods; guide them to thinking about food groups and essential nutritional items, for example protein, carbohydrates, fats and oils, water, fibre, vitamins and minerals.

ACTIVITY 1

Ask the students to match the five food groups with the correct images.

Key
A. protein; B. carbohydrates; C. fats and oils; D. fibre; E. minerals and vitamins

ACTIVITY 2

Put students in pairs. Give each pair a food group or nutritional item: *protein*, *carbohydrates*, *fats and oils*, *fibre*, *minerals and vitamins*. Ask them to brainstorm foods that belong to that item or group. Depending on the size of your class, you might have two or three pairs of students working on each food group. Match each pair with another pair working on the same food group and ask them to discuss their lists. As a whole class, collect the lists the students have suggested. Write the foods on the board and group the food items within circles to represent the food groups.

ACTIVITY 3

Working in pairs, ask the students to read the questions and answer them as quickly as they can. Then, working on their own, ask them to read the text *Things we need to eat to stay healthy* to check their answers.

Key
1. fibre; 2. carbohydrates; 3. fats and oils; 4. water; 5. protein; 6. fats and oils; 7. carbohydrates; 8. water; 9. protein

ACTIVITY 4

Ask students to write seven sentences from the table to make general statements about essential nutrients.
Note: it is possible to use several of the verb phrases in column B to make a number of the sentences. Ask the students to read the text again and check their sentences.

ACTIVITY 5

Print and cut out enough texts (A and B) per pair of students from the 'cut-outs' sheet. Ask the students to work in pairs, asking and answering questions about vitamins and minerals, based on their text. Explain that the texts are slightly different, so they should be careful not to simply read from the text. Encourage the students to think about their questions before they start. You may want to give examples of one or two possible types of question, such as, 'What can cause problems if we eat too much?' This would fit Student A's question 1.

Key
Student A: 1. minerals; 2. salt; 3. reactions in the body; 4. stored in the body; 5. in large quantities
Student B: 1. minerals; 2. many of our body's functions; 3. vitamins; 4. to absorb other minerals; 5. taken into the body

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ACTIVITY 6

Put students in groups of three and ask each group to choose a nutritional item that we need for a balanced and healthy diet. Ask each group to prepare a two-minute presentation about their item using PowerPoint, a poster, images or actual items. Ask the students to make sure that everyone speaks during the presentation. Refer students to the Your CLIL: Generalizations: Science article for phrases that will help them. You may decide to give this task for homework, depending on the time available. Ask the students to extend the table and use it to make notes when they listen to their classmates' presentations.

Language focus
Generalizations

Activity 1: 5 minutes
Activity 2: 10 minutes
Activity 3: 10 minutes

Get students practising language linked to generalizations by reading the Your CLIL: Generalizations: Science article.

ACTIVITY 1

Ask the students to read through the text and divide the bold generalization phrases into two groups: those to do with *frequency* and those to do with *quantity*.

Key
Frequency: *usually, generally, constantly*
Quantity: *most of, mainly, significant amounts, mostly, high levels, about 70%, for the most part*

ACTIVITY 2

Ask students to circle the phrase that correctly completes the sentences.

Key
1. a few; 2. little; 3. mainly; 4. mostly; 5. main part of; 6. much; 7. relatively small

ACTIVITY 3

Ask students to find the *generalizations of frequency* words in the wordsearch.

Key

Ask students to check their work in pairs and feed back the words they have found to the whole class.

WORKSHEET

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YOUR CLIL WORKSHEET

Content focus
Nutrition

WARM-UP

What do we need to eat in a balanced and healthy diet? Share your ideas with a partner and then the rest of the class.

ACTIVITY 1

Match the five food groups with the correct images.

_____ fats and oils _____ carbohydrates _____ protein

_____ fibre _____ minerals and vitamins

ACTIVITY 2

In pairs, quickly brainstorm as many foods as possible that belong to the nutritional item or food group your teacher gives you. Join another pair working on the same food group as you and share your list. Write down any foods you did not have.

ACTIVITY 3

In pairs, read the questions below and answer them as quickly as you can. If you don't know the answer, have a guess.

1. What is not truly a food and comes mainly from plant material?
2. Which item is important when we are very active, as it gives us energy quickly?
3. Which nutritional item is important in brain development in infants?
4. What is important for transporting nutrients and waste in and out of cells?
5. Which nutritional item do we need for building and repairing body tissues?
6. Which nutritional item can help keep the body warm?
7. Which nutritional item includes sugars, starch and cellulose?
8. Five or more days without what will result in death?
9. Which nutritional item is present in meat, dairy products, eggs, legumes and nuts?

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On your own, read the text *Things we need to eat to stay healthy* and check your answers to the questions.

Things we need to eat to stay healthy

Protein is present in meat, dairy products (such as milk), eggs, legumes (peas, beans and pulses) and nuts. We need protein for building and repairing body tissues, particularly muscle tissue, for making enzymes that are needed for **most of** the reactions in our bodies and for building antibodies that help protect us against disease. Proteins are made from twenty-two kinds of small building blocks called *amino acids*. A deficiency in one of the essential amino acids can cause serious health problems.

Carbohydrates include sugars, starch and cellulose. Cellulose is the material which forms plant cell walls. It is very tough and difficult to digest, so most of the carbohydrates we eat come from food containing sugars and starch. Carbohydrates are **mainly** found in plant foods, such as root crops (yams, potatoes), fruit, vegetables, peas and beans. Some animal products, such as milk, yoghurt and cheese, also contain **significant amounts** of carbohydrates. Carbohydrates provide us with energy. Although we can also get energy from protein and fats, carbohydrates are important when we are very active, as they produce energy quickly. A deficiency in carbohydrates can result in a lack of energy.

Fats and oils belong the lipids food group. Fats are **usually** solid at room temperature and oils are usually liquid. Fats are **generally** found in foods that come from animals, such as cheese, butter, margarine, cream, lard, milk and red meat. Oils are **mostly** found in foods from plants, especially the seeds and fruits. Some fish also contain **high levels** of oil. Fats and oils are essential in our diet because they can be digested to provide energy and water. Some fats and oils contain the fat-soluble vitamins, A, D and E, which we need for healthy growth. Fats make the cell walls of all our cells, form body oils and act as insulation. The fat that accumulates under the skin keeps the body warm and protects our internal organs. Fats are needed to make some hormones and are important in brain development in infants. However, a diet rich in animal fats is often associated with heart and circulatory disease.

Water is essential for living organisms. **About 70%** of the mass of an animal is water. All the chemical reactions that happen in the body occur in water, both inside and outside the cells. In humans, water is needed for transporting nutrients and waste products into and out of cells, for digestion, absorption, circulatory and excretory functions, for the absorption of water-soluble vitamins and to maintain the proper body temperature. Water is **constantly** lost from the body by breathing and sweating and it must be replaced, to avoid dehydration. Humans need to drink around two litres of water a day to replace what we lose and to stay healthy. Not drinking water for five or more days will result in death.

Fibre, also called 'roughage', comes **for the most part** from plant material such as fruit, vegetables and grains. It is not truly a food for humans, because it cannot be digested by the human body. However, it is important, because fibre helps the normal (or easy) elimination of faeces. It helps to prevent constipation and haemorrhoids and is also believed to reduce the risk of colon cancer, because the fibres in the faeces clean the colon as they pass along it.

Adapted from *Macmillan CXC Science Series, Integrated Science* by Tania Chung-Harris pp. 84-91 © Macmillan Caribbean 2005

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ACTIVITY 4

Working alone, match parts A, B and C to make generalizations about essential nutritional items. One sentence has been completed for you.

A	B	C
Proteins	also contain	about 70% water by mass.
Most of the carbohydrates we eat	are generally found in	enzymes needed for most of the reactions in our bodies.
Animals such as humans	are mainly found in	food containing sugars and starch.
Some animal products, such as milk, yoghurt and cheese,	contain	foods from plants, especially the seeds and fruits.
Fats	are used for making	foods that come from animals, such as cheese, butter, margarine, cream, lard, milk and red meat.
Oils	come from	plant foods.
Carbohydrates	come for the most part from	plant material such as fruit, vegetables and grains.
Fibres	are mostly found in	significant amounts of carbohydrates.

Read the text again to find and check your sentences.

ACTIVITY 5

Work with a partner. Each of you has a card with some text about vitamins and minerals on it. Ask each other questions to find the missing information in your texts.

Before you talk to each other, spend some time thinking about how you will ask a question to get the information you need. When you are ready, take turns asking and answering questions.

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ACTIVITY 6

In groups of three, choose a nutritional item we need for a balanced and healthy diet and create a two-minute presentation to give to the whole class. Make sure each member of your group speaks during the presentation!

To gather key information about your chosen food item, use the table below to make notes. Write down any important information from the other students' presentations. Use extra paper if necessary.

Essential item	Origin or Source	Example foods	Reasons why we need it
carbohydrates	*mainly found in plant foods*	*beans*	*energy*

WORKSHEET

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YOUR CLIL WORKSHEET

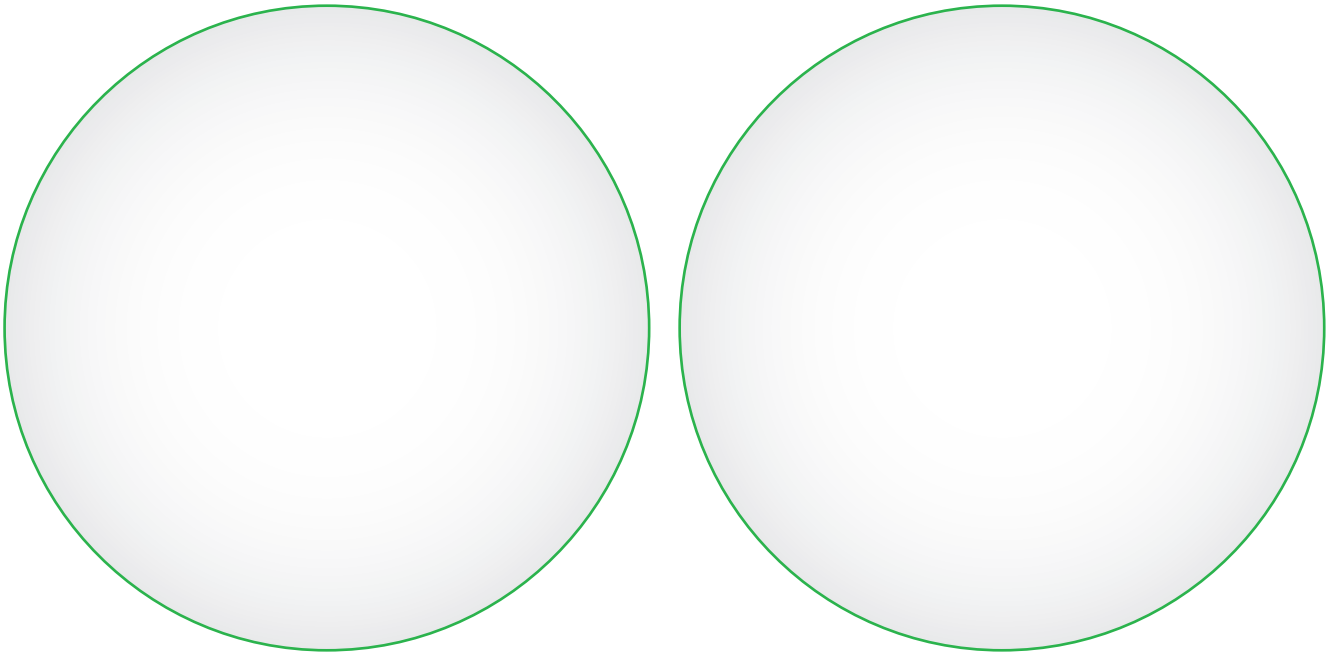
Language focus
Generalizations

ACTIVITY 1

Read through the text *Things we need to eat to stay healthy* and find the generalization phrases to do with *frequency* and those to do with *quantity*. Write the words in the correct circle.

FREQUENCY

QUANTITY



Check your answers with a partner.

ACTIVITY 2

Circle the correct phrase to complete the generalizations below.

1. When the body exercises hard, the muscles need extra oxygen after only *few / a few* seconds.
2. Plastics can easily be shaped and *a little / little* energy is required for moulding.
3. The carbohydrates we eat come *many / mainly* from plant foods.
4. We *mostly / most* get oils from plant foods, especially from seeds and fruits.
5. Proteins, carbohydrates and fats make up the *main part of / most* our diet.
6. It is *most / much* harder to lift an object when its centre of gravity is far away from your body.
7. We need to eat only *relatively small / several* amounts of minerals to stay healthy.

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YOUR CLIL WORKSHEET

ACTIVITY 3

Do the wordsearch and find the *generalizations of frequency* words. The words appear horizontally, vertically and diagonally.

always
commonly
constantly
frequently
generally
never
normally
often
rarely
sometimes
occasionally
usually

I	E	Q	G	E	N	E	R	A	L	L	Y	I	S	A	G
E	R	F	R	E	Q	U	E	N	T	L	Y	D	V	C	Q
N	E	B	T	P	R	Y	E	S	L	L	N	T	R	H	N
O	E	F	O	H	Z	E	E	A	N	S	O	S	T	Y	A
J	O	V	P	K	E	C	N	O	R	A	R	E	L	Y	V
K	C	F	E	V	S	O	M	E	T	I	M	E	S	E	Z
L	E	T	M	R	I	M	T	G	O	T	A	F	C	T	S
E	S	C	I	S	O	O	U	S	U	A	L	L	Y	V	S
A	E	P	A	C	B	R	Q	M	N	E	L	A	I	C	E
U	S	C	O	N	S	T	A	N	T	L	Y	N	E	R	G
E	C	A	Z	C	G	I	S	P	Z	G	O	I	O	O	I
O	U	U	O	E	E	Y	R	B	T	N	G	I	I	A	G
D	D	H	O	S	A	I	T	R	I	J	O	I	M	P	L
I	D	O	M	W	S	C	T	A	H	T	M	R	I	L	L
F	U	L	L	S	Z	B	R	R	V	I	Z	V	E	Y	S
K	E	A	N	X	W	F	A	K	N	P	E	I	E	R	S

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CUT-OUTS

Student A

To keep us healthy, minerals need to be eaten only in relatively small amounts. However, they contain elements that are essential for many of our body's functions, so a lack of minerals in the diet can quickly cause problems.
(1) _____ can also cause problems if too many are eaten, for example, too much (2) _____ may result in high blood pressure. Like minerals, we need to eat vitamins only in small amounts. However, they are essential in the body. Vitamins are used in many of the (3)_____ that convert nutrients into energy and body tissue. Some vitamins are needed to absorb other minerals and vitamins, so a deficiency in any vitamin can cause damage to our health. There are two groups of vitamins: fat-soluble vitamins and water-soluble vitamins. Water-soluble vitamins are easily taken into the body because they dissolve in water and mix easily with the blood. We need to eat water-soluble vitamins frequently; those we do not use in our body are excreted. Fat-soluble vitamins are absorbed from the fats and oils in our diet. Fat-soluble vitamins can be (4) _____, so they do not need to be eaten every day. This means that it is possible to eat too much fat-soluble vitamins and some, like vitamins A and D, are toxic if you eat them (5)_____.

Student B

(1) _____ needs to be eaten to keep us healthy. However, a deficiency of minerals in the diet can quickly cause health problems, because minerals contain elements which are essential for (2) _____. If we eat too many minerals, this can also cause health problems. Too much, salt, for example, can lead to high blood pressure. Like minerals, we also need (3) _____ .
They are also essential for many of the reactions in the body that convert nutrients into energy and body tissue. Some vitamins are needed (4) _____ and vitamins, and a deficiency of any vitamin can result in damage to health. There are two groups of vitamins: water-soluble vitamins and fat-soluble vitamins. Vitamins that dissolve in water mix easily with the blood and so are easily (5)_____. Water-soluble vitamins need to be eaten frequently and what we do not use in the body is excreted. Fat-soluble vitamins are absorbed from the fats and oils in our diet and can be stored in the body, so we do not need to eat them every day. This means that it is possible to eat too many fat-soluble vitamins and some, such as vitamins A and D, are toxic in large quantities.