Food Preparation and Nutrition

REVISION BOOKLET 2
NUTRITION

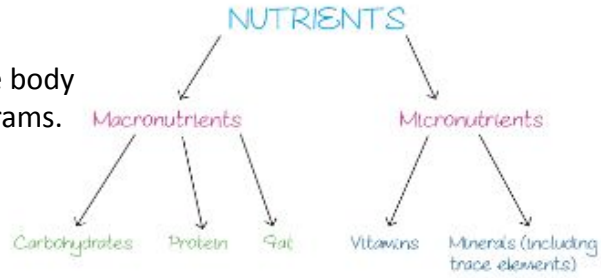
Name:
Tutor Group:

The Principles of Nutrition

Nutrients are chemicals found in food which give the body nourishment and are needed for the maintenance of life. The body needs nutrients to perform its daily **function**s properly. Health problems might occur if any one of these nutrients is lacking in a person's diet.

Macronutrients

Refer to carbohydrates, protein and fat which the body needs in large amounts. They are measured in grams.



Micronutrients

Refer to vitamins, minerals and trace elements which the body needs in small amounts.
They are measured in mg (milligram) or microgram.

Calories

Watch the video then answer the questions below. All the answers are mentioned somewhere in the video.

What is a calorie?

_____

How do we achieve a healthy balance of calories?

_____

What happens if we eat more calories than we burn?

_____

What happens if we burn more calorie than we replenish?

_____

How is a calorie defined?

_____

_____

How is the energy used?

_____

What is the basal metabolic rate?

_____

_____

What is the average number of calories needed by a man and a woman each day? What factors affect this?

_____

_____

How do the energy needs of people differ?

_____

_____

What factors affect an individual's ability to extract energy from food?

_____

_____

Macronutrients Keywords

Complete the table below with an overview of the key words of macronutrients.

Carbohydrate		Protein		Fat	
Keyword	**Definition**	**Keyword**	**Definition**	**Keyword**	**Definition**
Dietary fibre		Amino acids		Fatty acids	
Photosynthesis		Essential amino acids		Glycerol	
Monosaccharides		High Biological Value (HBV)		Saturated fats	
Disaccharides		Low Biological Value (LBV)		Unsaturated fats	
Non-Starch Polysaccharide (NSP)		Complementary Proteins		Fat-soluble vitamins	
Constipation		Kwashiorkor		Cholesterol	
Diverticular disease				Hydrogenation	
				Trans fats	

The Role of Nutrients

Complete the table below with an overview of key macronutrients, their function and sources.

Macronutrient	Needed For	Found In	Symptoms of Deficiency	Symptoms of Excess
Carbohydrate				
Protein				
Fat				

Sugar V Starch

Sugar and starch are both carbohydrates.

Sugary foods are simple carbohydrates that release energy quickly; they can cause uneven blood sugar levels.

Starchy foods are complex carbohydrates that provide slow release energy. Starch-based foods should be consumed as a source of energy, not sugary foods.

Complete the table below with examples of types of sugars and starches.

Sugar		**Starch**
Monosaccharides Glucose absorbed directly into the bloodstream during digestion	**Disaccharides** Formed when two monosaccharide molecules are joined	**Polysaccharides** Starch is a complex carbohydrate
Glucose	**Sucrose (Glucose+Fructose)**	**Starch**
Fructose	**Lactose (Glucose+Galactose)**	**Cellulose**
Galactose	**Maltose (Glucose+Glucose)**	**Pectin**

What is the difference between **intrinsic** and **extrinsic** sugars? _____

_____

Hidden Sugar

Sugar is often described as having **empty calories**, meaning that it adds no nutrients to the diet. Yet in the UK the average person eats 38kg of sugar a year. **Hidden sugar** can be found in readymade foods such as bread, soups, sauces, fruit-flavoured yogurts and breakfast cereals. Hidden sugars are ingredients that are present in food and drink but may not be recognised as sugar because they do not taste sweet. Even so, they can contribute to excess calories and can cause tooth decay.

If you read the nutritional labels on food packaging you will see how much sugar there is in any food product. Remember that there are different names for 'sugar' such as glucose syrup, corn syrup or sucrose.

Rethink your Drink

Match the drink to the sugar content per 100ml:

Coca Cola – Juicy Water – Monster Ripper – Innocent Smoothie – Lucozade – Coconut Water – Vitamin Water – Strawberry Volvic Water

3g	4.8g	5g	6.8g
8.3g	8.4g	10g	10.6g

On average, how often do you drink sugary drinks?
Sugary drinks include juices (including 100% fruit juice), soda, sports drinks, energy drinks, lemonade, and sweetened coffee or tea drinks.

__ Only at special events __ Daily __ Once a week __ 3 times a week

What is a realistic goal for how many sugary drinks, including 100% juice; you could limit yourself to each day?

_____

_____

_____

Tips to Reduce Sugar Intake

List 10 ways to reduce sugar intake in the diet:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Protein

Protein is a very important macronutrient in the diet. It is essential for the growth and repair of the body and for the maintenance of good health. It is also needed in the production of body chemicals such as enzymes and hormones.

Animal Sources (HBV)

Vegetable Sources (LBV)

Complementary Protein

_____

_____

_____

_____

_____

_____

Amino Acids

Proteins are made up of chains of smaller building blocks called **amino acids**.

Amino acids can be categorised as essential amino acids (indispensible)- these are amino acids that must be supplied to us through our diet, and non-essential amino acids (dispensable)- that can be made in the body.

Essential Amino Acids (Adults)

For adults, 8 amino acids have to be provided in the diet:

Isoleucine	Leucine	Lysine	Methionine
Phenylalanine	Threonine	Tryptophan	Valine

Essential Amino Acids (Children)

Children are unable to make enough of the amino acids to meet their needs. These amino acids are referred to as 'conditionally' essential.

Arginine	Cysteine	Glutamine	Glycine
Histidine	Proline	Tyrosine	

How Much Protein Do We Need?

Children		**Adults**	
1-3 years		19-50 years	
4-6 years		50+ years	
7-10 years		Why does the amount of protein needed vary with age?	
11-14 years		_____	
15-18 years		_____	
		_____	

Nutritional Value of Fat

Fats play an important part in our diet. They provide us with energy and essential vitamins and fatty acids.

Why do we need fat in our diet?

As well as providing energy, foods containing fat also perform the following functions:

1. _____
2. _____
3. _____
4. _____
5. _____

Fats can be divided into two main types:

1. Saturated Fat

Saturated fats come mostly from animal sources and are often referred to as unhealthy fats.

2. Unsaturated Fat

Unsaturated fats are the healthier fats and are mostly from plant sources.

They are often liquid at room temperature and help to promote the healthier type of cholesterol in our blood (HDL).

There are two main types. Give examples of each:

Monounsaturated	**Polyunsaturated**
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

How much energy does 1g of fat provide?

_____

Trans-Fats

Trans-fats are vegetable oils which have been processed to make them hard. This is done by passing hydrogen through liquid oil, this is called **hydrogenation**. Explain why trans-fats are unhealthy, why they are used and what products they can be found in.

_____

_____

_____

_____

Cholesterol

Cholesterol is a waxy substance that circulates in the blood. It does not dissolve in the blood but instead it bonds to lipoproteins; which transport the cholesterol between cells.

Below, describe the two types of cholesterol and how cholesterol levels can affect our health:

Low-Density Lipoproteins (LDL)

_____
_____
_____
_____

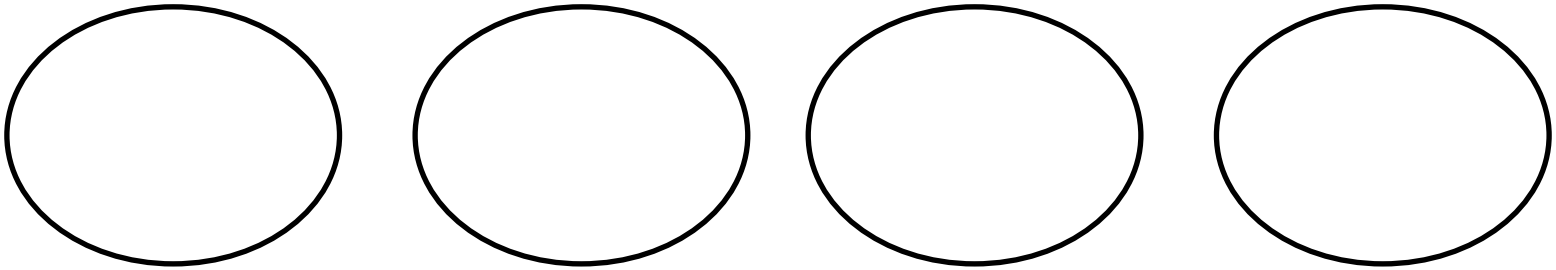
High-Density Lipoproteins (HDL)

_____
_____
_____
_____

Atherosclerosis

High levels of LDL cholesterol can build up in your arteries (called atherosclerosis) leading to coronary heart disease. Fatty deposits form on the artery walls and this causes hardening and narrowing of the arteries. This can be dangerous as it causes restricted blood flow; this can damage the organs and stop them functioning properly.

In the circles below, draw how atherosclerosis builds up in arteries.



Plant Sterols and Stanols

What are the health benefits of foods fortified with plant sterols and stanols?

_____
_____
_____

Micronutrients Keywords and Key Points

Complete the table below with an overview of the key words of macronutrients.

Vitamins		Minerals	
Key Words	**Meaning**	**Key Words**	**Meaning**
Fortified		Peak bone mass	
Rickets		Haemoglobin	
Osteomalacia		Anaemia	
Antioxidant		Thyroid	
Thiamin		Dehydration	
Riboflavin		Lactating	
Spina bifida			
Ascorbic acid			

Vitamins and Minerals

You have seen the claims on drinks and breakfast cereals: 'Rich in vitamin C'; 'Good source of calcium'.
Vitamins and minerals are essential for our health.

Vitamins and minerals are called **micronutrients** which means they are needed in smaller quantities than the macronutrients. If you eat a variety of foods and a balanced diet you will get most of the nutrients you need.

Vitamins

There are two groups of vitamins: fat-soluble and water-soluble.

The fat-soluble vitamins – A, D, E, and K – dissolve in fat and are stored in your liver.

The water-soluble vitamins – C and the B-complex vitamins – dissolve in water so that your body can absorb them. Your body can't store these vitamins and any vitamin C or B that your body doesn't use is passed out in your urine. You need a supply of these vitamins every day.

Minerals

Minerals are found in the soil and water, and pass into plants and animals that we eat for food.
Your body needs small amounts of minerals to grow and stay healthy.

Minerals are necessary for three main reasons:

- Building strong bones and teeth
- Controlling body fluids
- Turning food into energy

You need to know:

Vitamins	Minerals	Trace Elements
A – C – D – E – K B Group: B1 Thiamin B2 Riboflavin B3 Niacin B5 Pantothenic Acid B6 Pyridoxine B7 Biotin B9 Folic Acid B12 Cobalamin	Calcium Iron Potassium Phosphorous Magnesium Sodium	Iodine Fluoride Selenium Zinc

Vitamins

A	C	D	E	K
Needed for:	**Needed for:**	**Needed for:**	**Needed for:**	**Needed for:**
Found in:	**Found in:**	**Found in:**	**Found in:**	**Found in:**
Symptoms of Deficiency:	**Symptoms of Deficiency:**	**Symptoms of Deficiency:**	**Symptoms of Deficiency:**	**Symptoms of Deficiency:**
Symptoms of Excess:	**Symptoms of Excess:**	**Symptoms of Excess:**	**Symptoms of Excess:**	**Symptoms of Excess:**

B Group Vitamins

B1 Thiamin **Needed for:** **Found in:** **Symptoms of Deficiency:** **Symptoms of Excess:**	**B2 Riboflavin** **Needed for:** **Found in:** **Symptoms of Deficiency:** **Symptoms of Excess:**	**B3 Niacin** **Needed for:** **Found in:** **Symptoms of Deficiency:** **Symptoms of Excess:**	**B5 Pantothenic Acid** **Needed for:** **Found in:** **Symptoms of Deficiency:** **Symptoms of Excess:**
B6 Pyridoxine **Needed for:** **Found in:** **Symptoms of Deficiency:** **Symptoms of Excess:**	**B7 Biotin** **Needed for:** **Found in:** **Symptoms of Deficiency:** **Symptoms of Excess:**	**B9 Folic Acid** **Needed for:** **Found in:** **Symptoms of Deficiency:** **Symptoms of Excess:**	**B12 Cobalamin** **Needed for:** **Found in:** **Symptoms of Deficiency:** **Symptoms of Excess:**

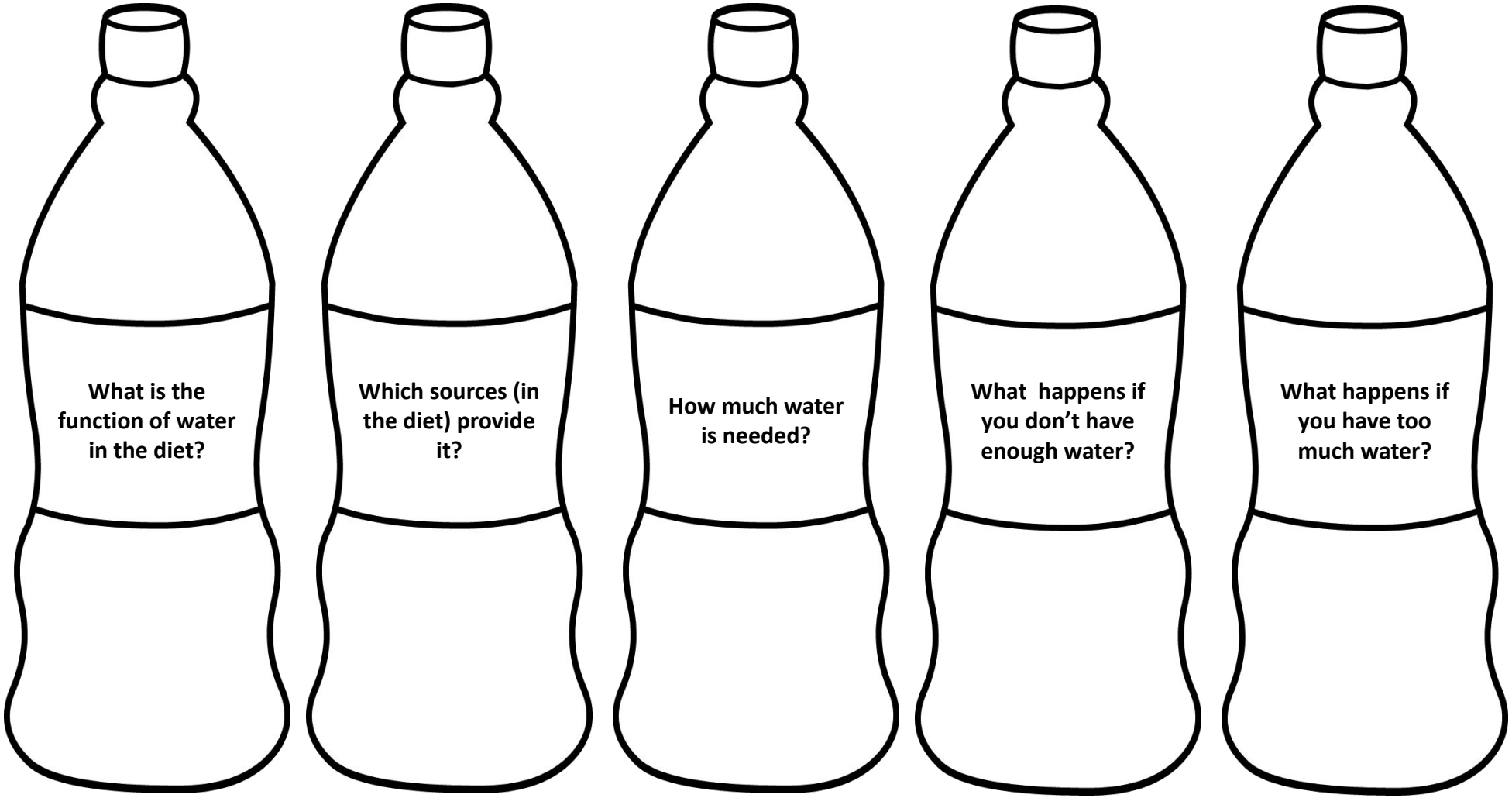
Minerals and Trace Elements

Calcium **Needed for:** **Found in:**	**Iron** **Needed for:** **Found in:**	**Potassium** **Needed for:** **Found in:**	**Iodine** **Needed for:** **Found in:**	**Fluoride** **Needed for:** **Found in:**
Phosphorous **Needed for:** **Found in:**	**Magnesium** **Needed for:** **Found in:**	**Sodium** **Needed for:** **Found in:**	**Selenium** **Needed for:** **Found in:**	**Zinc** **Needed for:** **Found in:**

Water

Water is essential for life. The human body is 50-75% water, and it is an important component of blood, digestive juices, urine and perspiration.

Fill the bottles below with key facts about water in the diet.



Fibre- Non-Starch Polysaccharide (NSP)

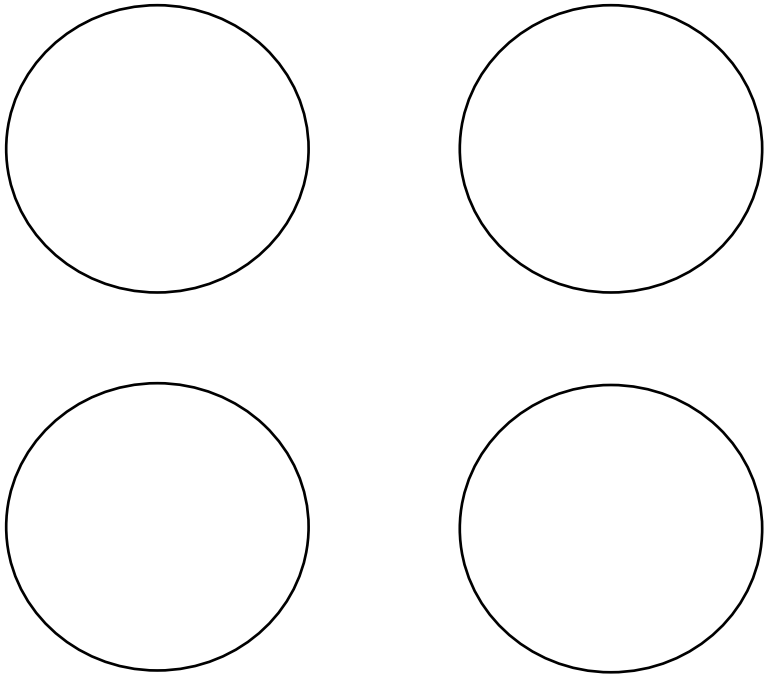
Fibre is needed to keep the gut healthy and prevent constipation. Fibre is not digested when we eat it. In the UK most people eat far too little fibre, on average about 12 grams a day or less. Ideally, adults should aim for 18 grams a day, or a little more. All plant-based foods contain fibre. Good sources of fibre are fruit, vegetables, wholegrain rice and pasta, wholemeal bread, many breakfast cereals, nuts, seeds and bran.

Serving portions of a selection of foods with NSP content		
Food	**Serving size (weight)**	**NSP content (g)**
All Bran	1 medium bowl (40g)	9.8
Weetabix	2 biscuits (40g)	3.9
Porridge	1 medium bowl (160g)	1.3
Cornflakes	1 medium bowl (30g)	0.3
Wholemeal bread	1 medium slice (36g)	0.5
Brown bread	1 medium slice (36g)	1.3
White bread	1 medium slice (36g)	0.5
Wholemeal flour	1 tbsp. (30g)	2.7
White flour	1 tbsp. (30g)	0.9
Whole-wheat pasta	Medium portion (230g)	8.1
White pasta	Medium portion (230g)	2.8
Brown rice	Medium portion (180g)	1.4
White rice	Medium portion (180g)	0.2
Orange	1 medium (160g)	2.7
Apple	1 medium (100g)	1.7
Banana	1 medium (100g)	1.1
Baked potato skin	1 medium (180g)	4.9
Baked beans	3 tbsp. (120g)	4.4
Frozen peas	2 tbsp. (60g)	3.1
Lentils, boiled	3 tbsp. (90g)	1.7
Tomato	Medium (85g)	0.9

Meal Planning

Use the chart on the left, showing the dietary fibre (NSP) content for serving sizes for different foods.

Plan a day's menu for yourself to include some of these foods. The aim is to provide around 18 grams of dietary fibre (NSP). Give examples for breakfast, lunch and evening meal as well as a snack. Give reasons for your choice.



Total fibre content (grams): _____

_____

_____

_____