Grade 8 Natural Science Worksheet

Nutrition

Part One: The main nutrients

1. What is meant by the terms nutrition and nutrients? [4]
2. Draw up a table of the main types of nutrients (the food groups) and indicate foods that provide these nutrients. Say what each of the nutrients do in our bodies. Stick in pictures to represent the foods that contain these nutrients. [26]
3. What role do vitamins and minerals play in our diet? Find out some examples of vitamins and minerals that your body needs and say why they are important. Write your answer in a paragraph. [10]

Part Two: Design a menu

Design a menu for a teenager to eat over the course of one day – breakfast, lunch and dinner, as well as any snacks, which is healthy and has a balanced consumption of all the important nutrients.

[12]

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Rubric to assess menu

Criteria	Level 4 [4]	Level 3 [3]	Level 2 [2]	Level 1 [1]
Menu is balanced in terms of carbohydrate, protein and fat intake.	Outstanding.	Good.	Satisfactory.	Poor.
Menu is balanced in terms of vitamin and mineral intake.	Outstanding.	Good.	Satisfactory.	Poor.
Menu provides sufficient food for a teenager, and the food choices are interesting and attractive.	Outstanding.	Good.	Satisfactory.	Poor.

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Part Three: Examine food labels

When you go into a shop to buy food, how do you know what you are getting in terms of nutrients? You look at food labels!

1. What is the value of food labels? What kinds of things can you learn from food labels? Write a paragraph explaining your answer. [10]
2. Using the food labels on some common products, calculate the RDA for two vitamins or minerals? [5]
3. Find some examples of food labels that are misleading and could be misinterpreted. [5]

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Suggested Solutions

Question number	Possible marks	Solution
1.1	4	Nutrition refers to the food that is eaten ✓ to build ✓ and maintain ✓ the body. Nutrients are the raw materials required for cells to function and grow. ✓ The term nutrient means any substance in the food we eat that provides what the body cells need to perform their functions, for instance cell growth, muscle repair, production of important chemicals like digestive enzymes and the transfer of messages in the nerve cells.
1.2	26	Learners will construct tables and add illustrations: 2 marks for table layout and 6 for illustrations. Use the following as a guideline for the information to be included in the table: Allocate 6 marks per nutrient in the table if facts are valid and accurate. Carbohydrates consist of the elements carbon(C), hydrogen (H) and oxygen (O) and include sugars, starch, cellulose and other compounds found in living organisms. Foods rich in carbohydrates are the primary source of energy for all body functions. The most readily-digestible carbohydrates are the simple sugars which are mainly glucose, lactose (from milk) and fructose (from fruits). Sugars such as in cakes, sweets, and fizzy drinks are easily digested carbohydrates. More complex sugars and starches in bread, noodles, pasta, fruit and vegetables take longer to digest but have several advantages over the simpler sugars. One advantage is a slow supply of energy to the body, rather than a sharp "energy spike". Proteins consist of amino acids, simple chemicals that contain carbon(C), hydrogen (H), oxygen (O) and nitrogen (N). Proteins take many forms in our bodies – enzymes, hormones, proteins and even skin, hair and nails are made of proteins. The body needs amino acids from our food to build our own body protein. Essential amino acids are obtained from food such as meat, eggs and dairy products. Vegetable proteins are found in beans and other vegetables too. Dietary fats supply some of the body's energy needs, particularly because they can be stored in parts of the body. Fats help fat-soluble vitamins (A, D, E and K) to be absorbed by the body and they are important structural components of cell membranes and even the brain.
1.3	10	The foods mentioned before are called the macronutrients. Macro means big – so these are the nutrients we need in large amounts. Vitamins and minerals are definitely needed in our diets, but they are called micronutrients because we need them in smaller amounts. The table below summarises the information that the learners may need.

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Vitamins	For …	Found in …
A	Healthy skin, teeth, soft tissues	Dairy, fish, yellow vegetables
B1 – thiamin	Breaking down and using nutrients in carbohydrates, protein and fats	Whole grains and pork
B2 – riboflavin	Production of red blood cells and body growth	Dairy and breakfast cereals
B3 – niacin	Breaking down and using carbohydrates, proteins and amino acids	Beef, pork, liver, milk, eggs
B12 – cyano-cobalamin	Normal nerve and blood function	Beef, lamb, veal, dairy
C – ascorbic acid	Aiding absorption of iron and copper, healthy bones	Sweet peppers(capsicums), blackcurrants, guava, orange
D	Immune function, muscle strength	Sunlight on skin allows body to manufacture vitamin D; also found in salmon, herring and mackerel oils and in eggs.
E – tocopherol	Maintaining heart function, circulation, skin and nervous system	Chicken, wheat germ, cashews, peanuts
K – phylloquinone	Normal blood clotting	Spinach, canola oil, cabbage

Minerals	For …	Found in …
Calcium	Development and maintenance of bones and teeth, normal muscle and nerve function	Dairy, legumes, bony fish

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<tr><td>Fluoride</td><td>Healthy bones and teeth</td><td>Fluoridated water</td></tr>
<tr><td>Iodine</td><td>Normal thyroid function (important in the growth and development of nervous system, oxygen consumption in cells</td><td>Saltwater fish, iodised salt</td></tr>
<tr><td>Iron</td><td>In red blood cells (important for transporting oxygen in the blood), myoglobin (muscle protein</td><td>Red meat, wholegrain cereals</td></tr>
<tr><td>Magnesium</td><td>More than 300 enzymes, energy production</td><td>Green vegetables</td></tr>
<tr><td>Potassium</td><td>Muscle contraction, nerve impulses</td><td>Found in tomatoes, greens</td></tr>
<tr><td>Sodium</td><td>Maintain body’s water balance</td><td>Table salt, cheese and bread</td></tr>
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<tr><td>2</td><td>12</td><td>Answers will vary. Get learners to check each other’s menu to see that it is balanced and healthy. See rubric below.</td></tr>
<tr><td>3.1</td><td>10</td><td>Learner answers will vary, but here are some guidelines:
Let us take the example of beef mince. One can buy “beef mince” or “flavoured beef mince”. The first one should contain only pure beef while the second contains beef with chemical flavourings, which are probably not natural products. One can also buy ordinary beef mince or “lean beef mince”. The latter is made from meat that contains very little fat.
South African law controls the pictures and wording used on food labels to protect the consumer from being misled. ✓✓✓✓
Take note of the following when examining food labels:
• Name: ✓ A producer must give a true and accurate description of the product. If the label says “carrot cake” the product must contain real carrots. Any pictures must be accurate and truthfully reinforce the information given.
• Ingredients list: ✓ We must be told exactly what we will be eating. The ingredients on the list appear from the one with the greatest</td></tr>
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		quantity to the least. If there are ingredients one wishes to avoid for religious, cultural, moral or health reasons, the label must provide the consumer with the necessary information. Some people have an allergic reaction to preservatives such as benzoic acid and sulphur dioxide, so their presence must be clearly indicated by their full and correct chemical name. • Nutritional information: ✓ This section gives you information on the food groups present (carbohydrate, protein, fat, vitamins and minerals) and the energy content per unit, e.g. kilojoules (kJ) per 100 g. Producers must declare any nutrients that are present in excess of 15% of the recommended daily allowance (RDA). • Vague terms like "nutritious", "enriched" and "fortified" must be accompanied by facts. • The term "non-nutritive sweetener" must be included where artificial sweeteners are used. ✓ • Instructions showing how best to prepare the product require of the manufacturer to provide the following information on the label: ◦ Storage and cooking instructions. ✓ ◦ "Best eaten before" date (this does not mean the food will have gone bad but rather that the risk of chemical or microbial action will increase after this date). ✓
3.2	5	Answers will vary depending on food products chosen, but here is a guideline: Using the food labels on some common products, calculate the RDA for two vitamins or minerals. Marmite spread contains 0,306 mg of Riboflavin (vit B2) and 0,1105 mg of Folic acid per 8,5 g serving. 0,306 mg is 19,1% of the recommended daily allowance (RDA) which means that the full (100%) RDA for Riboflavin is 1,602 mg. One serving of Marmite provides 55,3% of the RDA of Folic. The full RDA is therefore is about 0,2 mg or the amount of Marmite on two slices of bread.
3.3	5	Find some examples of food labels that are misleading and could be misinterpreted. See beef mince example in 3.1.

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