

DIETARY CONSIDERATION

Mmm, nothing beats a super-sized burger and a glass of cola! It's pure deliciousness!



Samar, I know those treats taste great, but too many greasy, sugary snacks can really slow you down and harm your health. You must have more salads and fruit.

Really? I always feel energized after a heavy meal of burger or pizza or *pakor*as!



Short-term satisfaction can lead to long-term problems like fatigue and heart issues. A healthy diet is very important! Enjoy your favourites in moderation and add nutritious options to keep your body and heart happy.



LEARNING OUTCOMES

The learner-

- describes nutrition and its components
- explains the need and importance of a balanced diet
- elaborates various factors affecting diet

6.1 MEANING OF NUTRITION AND ITS COMPONENTS

Food can be understood as a substance or material obtained from plants, animals or water. Food is made of nutrients which occur naturally and are metabolized by an organism to grow, sustain and repair vital life processes. The primary function of food is nourishment for an organism. This is furnished by the elements of food. The food we eat provides nourishment to the body and is made up of small units

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that the body uses for energy & growth. Good nutrition is essential for good health. However, if our diet provides the important units in incorrect amounts, either very little, or in excess of what is required, it results in an imbalance of nutrients in your body. The condition is responsible for various diseases.

Study about the food and its usage by our body is called nutrition. Nutrition includes food intake, digestion, absorption, assimilation, and excretion of waste. Nutrition can be defined as the interaction of nutrients and other substances present in the food. This ingestion and assimilation of food helps in the maintenance, growth, reproduction and health of an individual.

“Nutrition is science where the process of food intake and utilization of it by our body is studied.”

6.1.1 Nutrients

We have learned that food nourishes our body and helps in its proper growth and functioning. This growth and nourishment happens due to nutrients which are available in the food. Food comprises of all the substances that organisms consume to survive. Nutrition is obtained from different nutrients.

“Nutrients are chemical substances in food which are required by our body for energy, growth and maintenance.”



DO YOU KNOW?

National Nutrition Week is celebrated each year from 1st September to the 7th September in India. The purpose is to increase awareness among the people about importance of nutrition for their health and well-being.

For more information you can visit <https://www.indiacelebrating.com/events/national-nutrition-week/>

Type of the Nutrients

There are mainly two types of nutrients:

- 1) Macronutrients
- 2) Micronutrients

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**Note****Macro Nutrients**

The majority of the food that we consume consists of macro nutrients. These are nutrients taken in large amounts. They supply energy, and help in growth and maintenance of the body. Macro nutrients consists of carbohydrates, proteins and fat. Every individual has food requirement of which approximately 55-60% is carbohydrate, 20-30% is protein, and 10-15% is fat. Water does not provide energy but is a very vital nutrient which helps in functioning of metabolic processes and various regulatory functions in the body. Water is required by our body in a large amount thus it is also considered as a macro nutrient.

- A. Carbohydrates** are chains of carbon, hydrogen and oxygen. The main function of carbohydrates is to provide energy to the body. It provides 4 Kcal of energy per gram.
- B. Proteins** are the nitrogen-containing constituent of food. Proteins contain different types of amino acids and have a very complex structure. There are 20 amino acids joined in various sequences to form different types of protein. Nine amino acids which are called **essential amino acids** cannot be formed in our body. Thus, they must be obtained through diet. Other amino acids are called non-essential amino acids which can be synthesized inside the body.

The functions of proteins are growth and maintenance of tissues, formation of essential body compounds, transportation of nutrients, regulation of water balance, maintenance of appropriate pH level, defence and detoxification of the body. Proteins also act as a source of energy. They provide 4 Kcal of energy per gram.

- C. Fats (Lipids)** are made of three elements carbon, hydrogen and oxygen. Fats are more concentrated source of energy than carbohydrates and give 9 Kcal of energy per gram. The presence of different types of fatty acids make fats liquid or solid. Fatty acids are classified as saturated fats or unsaturated fats. Saturated fats are also called animal fats and are associated with health risks. They increase the risk of heart diseases by increasing LDL (bad) cholesterol. Whereas, Monounsaturated and polyunsaturated fatty acids are unsaturated fats. They help to reduce blood cholesterol level and thus lower the risk of heart diseases.

Fats function as energy reserves, and are essential constituents of the membrane of every cell. They help in absorption of fat-soluble vitamins, are regulators of body functions, and work as insulators and protectors of vital organs.

- D. Water** is made of hydrogen and oxygen. It is essential for life and is a major component of our body. 70% of lean body mass is made up of water. It is the medium of all fluids including saliva, blood, digestive juices, urine, faeces, and perspiration. Water is considered a universal solvent and plays an important role in the regulation of body temperature. It bathes the body cells and keeps them moist. It is also an important lubricant for the joints.





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Micro Nutrients

Micro nutrients are nutrients which are required by our body in very small amounts. These nutrients are extremely important for the normal functioning of our body. Minerals and Vitamins are included in micro nutrients.

- A. Minerals** are compounds that result from the inorganic process of nature. There are minerals which are required by our body in large amount and are called macro minerals. On the other hand, micro minerals are those minerals which are required by our body in small amounts. Micro minerals are also called Trace minerals.
- a. Macro minerals:** Minerals that are present at levels more than 0.05 per cent in the human body are defined as macro minerals. Calcium, phosphorus, magnesium, sodium and potassium belong to the category of macro minerals.

Functions and sources of Macro-minerals

Minerals	Important functions	Sources
Calcium	Bone formation, tooth formation, growth, required as co-factor and regulator of biochemical reserves, and helps in blood clotting	Milk, cheese, yogurt, eggs, green leafy vegetables etc.
Magnesium	Repairs and maintains body cells, maintains electrical potential in nerves and muscle membranes	Meat, brown rice, beans, whole grain etc.
Phosphorus	Mineralization of bone and teeth, facilitation of energy transaction, absorption and transport of nutrients, regulation of protein activity and regulation of acid-base balance	Rice bran, skim milk powder, soya bean, carrot, cheese, almonds, walnut etc.
Potassium	Major ingredient in intracellular fluid, helps maintain water balance, acid-base balance, glycogen formation, protein synthesis	Fruits, vegetables, legumes, nuts, whole grain meats etc.
Sodium	Major ingredient in extracellular fluid, helps maintain water balance, acid base balance, cell membrane permeability, absorption of glucose	Salt, cheese meat, eggs, carrots, spinach, celery etc.



**Note**

- b. Micro minerals** (Trace minerals): Minerals present at level less than 0.05 per cent in the human body are defined as micro minerals. Some of the micro minerals are iron, zinc, copper, fluorine, chromium, manganese and cobalt.

Functions and sources of Micro-minerals

Minerals	Important Functions	Sources
Chromium	Stimulates insulin activity	Soyabeans, black gram, carrots, tomato, ground nut, bajra, barley etc.
Cobalt	Protects from anaemia	Green leafy vegetable, milk, meat etc.
Copper	Formation of haemoglobin, prevention of anaemia	Eggs, pulses, green leafy vegetables etc.
Fluorine	Protects against tooth decay, imparts stability in bones, prevents osteoporotic fractures	Hard water, sea fish, tea etc.
Iodine	Production of hormones in thyroid gland, regulating growth and development	Iodized salt, fish, sea food etc.
Iron	Transportation and storage of oxygen, co-factor of enzymes and other proteins, formation of red blood cells	Liver, meat, eggs, dry fruits, banana, green leafy vegetables etc.
Manganese	Work as enzyme component in general metabolism	Cereals, whole grains, legumes, soya beans, leafy vegetables etc.
Zinc	Essential for normal growth, development, reproduction and immunity, maintain healthy appetite	Meat, poultry, eggs, nuts, cereals, pulses, vegetables etc.





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B. Vitamins are organic substances of food which are required by our body in less amount for the maintenance of health, growth, normal metabolic functioning and state of wellbeing of a person. Vitamins are divided into two categories:

- a. **Fat soluble vitamins:** Vitamins which are soluble in fat are stored in the body cells and are not passed out of body easily. These include Vitamin A, D, E and K.

Functions, sources and Deficiency Diseases of Fat-soluble vitamins

Vitamins	Important Functions	Sources	Deficiency Diseases
Vitamin A (Retinol)	Promoting healthy vision, providing resistance from infections	Cod liver oil, animal liver, egg yolk, milk products, mango, papaya etc.	Night blindness and Keratomalacia
Vitamin D (Calcifuiol)	Absorption of calcium and phosphorus, maintaining normal function of parathormone	Sunrays, milk, butter, fish liver oil etc.	Rickets, Osteomalacia
Vitamin E (Tocopherol)	Growth of body organs, works as anti-oxidant	Green vegetables, kidney, coconut oil, butter, maize etc.	Anaemia or low red blood count
Vitamin K (Phylloquinone)	Helps in clotting of blood, prevents haemorrhage and excessive bleeding	Tomatoes, potatoes, spinach, cabbage, eggs, meats etc.	Anaemia

- b. **Water soluble vitamins:** Vitamins soluble in water pass out through kidneys and leaves the body as urine or stool if not used by the body. These include Vitamin C and B complex.



Functions, sources and Deficiency Diseases of Water-soluble vitamins

Vitamins	Important Functions	Sources	Deficiency Diseases
Vitamin B ₁ (Thiamine)	Works as coenzyme-needed for energy metabolism, important for nerve function, needed for DNA and RNA synthesis	Whole-grain cereals, pulses, peanuts and seeds, mushrooms etc.	Skin diseases, headaches, lack of concentration, sleeplessness
Vitamin B ₂ (Riboflavin)	Act as a co-enzyme needed for energy metabolism, important for normal vision and skin health	Milk and milk products, animal products like eggs, liver, kidney, green leafy vegetables etc.	Stunted growth, unhealthy skin
Vitamin B ₃ (Niacin)	Part of a co-enzyme needed for energy metabolism, important for nervous system, digestive system, and skin	Whole-grain cereals, pulses, meat, poultry, fish, vegetables etc.	Indigestion, fatigue
B5 (Pantothenic Acid)	Part of co-enzyme needed for energy metabolism	milk, meat, peanuts, eggs etc.	Fatigue, Insomnia, depression
Vitamin B ₆ (pyridoxamine)	Part of a co-enzyme needed for metabolism of proteins and amino acids and also involved in activity of many enzymes required for metabolism of carbohydrates, fats and proteins, it also helps in making white blood cells and heme in haemoglobin	Meat, poultry, fish, nuts, sunflower seeds, pulses, whole grains, spinach, bananas, potatoes etc.	Unhealthy skin, anaemia
B7 (Biotin)	Functions as co-enzyme in metabolic reactions.	organ meats, liver, kidney, egg yolk, nuts, almonds, peanuts etc.	Impaired growth, muscle strain

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Vitamins	Important Functions	Sources	Deficiency Diseases
B9 (Folic Acid)	Part of an enzyme needed for making DNA and new cells, especially red blood cells, formation of neurotransmitters, maintenance of normal blood pressure and reducing risk of cancer	spinach, pulses, oranges, cabbage, cauliflower, broccoli etc.	Loss of leucocytes
Vitamin B ₁₂ (Cobalamin)	Part of co-enzymes needed for making new cells, important to nerve function	Meat, poultry, fish, seafood, eggs, milk etc.	Anaemia
Vitamin C (Ascorbic Acid)	Antioxidant, role in collagen formation hence in wound healing, part of an enzyme needed for protein metabolism, important for immune system, helps in iron absorption	Citrus fruits, fresh vegetables etc.	Scurvy



DO YOU KNOW?

Vitamins, especially water-soluble vitamins, can be lost from food when exposed to heat, light, and/or air. Cooking food, especially if they are chopped up and cooked for long time, reduces their vitamin content.



Activity 6.1

Fill the following information in the given table:

- List the two main dishes you ate in dinner
- Identify the major macro and micro nutrients present in them.

S.No.	Dishes eaten	Nutrients	
		Macro	Micro
1			
2			

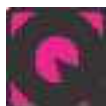
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Activity 6.2

- Collect any 5 packaged foods and make a Comparative table of energy consumed from them with the help of the tables given at the back of the packets. Also identify the healthiest food out of the five.



Intext Questions 6.1

1. Tick (✓) the correct option.

- What are the main components of nutrition?
 - Carbohydrates, Proteins, Fats, Vitamins, Minerals, Water, and Fiber
 - Carbohydrates, Proteins, Fats, Water only
 - Proteins, Fats, Water, and Fiber only
 - Fats, Water, and Vitamins only
- Why is a balanced diet important for maintaining health?
 - It helps increase fat stores in the body
 - It provides the body with essential nutrients for growth, repair, and energy
 - It helps in reducing weight
 - It prevents all diseases
- Which of the following factors does NOT affect an individual's diet?
 - Age and gender
 - Climate and cultural preferences
 - Media influence and food availability
 - Number of hours spent watching TV
- Match the following nutrients in column I with the sources from which we get it in the column II.

Nutrients

- Carbohydrates
- Fats
- Proteins

Food Sources

- Cheese, Ghee
- Bajra, Potatoes
- Butter
- Paneer, Milk
- Wheat, Rice
- Pulses, Meat



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5. Write each of the following vitamins whether they are Water soluble or Fat soluble

Vitamins	Water Soluble	Fat Soluble
A		
B		
C		
D		
E		
K		

After studying nutrition and nutrients you may be able to understand the importance of each nutrient. In the next section we will discuss about the need and importance of balanced diet.

6.2 NEED AND IMPORTANCE OF BALANCED DIET

In nutrition, the sum of food consumed by a person or other organism is called diet. In simple words a diet is everything a person or organism takes in as food. A diet may be healthy or unhealthy. A healthy diet helps to protect against malnutrition in all its forms, as well as against noncommunicable diseases including diabetes, heart disease, stroke and cancer. An unhealthy diet on the other hand can lead to health-related problems. So, to have a healthy life one must eat a balanced diet.

The question that arises is what is balanced diet? A balanced diet refers to a diet which provides all the essential food constituents. A balanced diet may be defined as which includes different types of food items, required in appropriate quantity to fulfill the need of all the nutrients and small provision is made for extra nutrients to withstand the period when body is in deficiency.

In other words, a balanced diet can be defined as one which contains different types of food stuffs in such quantities and proportion that the need of all the nutrients is adequately met and a small provision is made for extra nutrients to withstand the period when adequate food or nutrient is not consumed. The term balanced diet refers to the ultimate proportion of the nutrients resulting from combining different foods.

Health educators claim that a balanced diet can be achieved by taking as varied a selection of food as possible. To consume a balanced diet one has to ensure that

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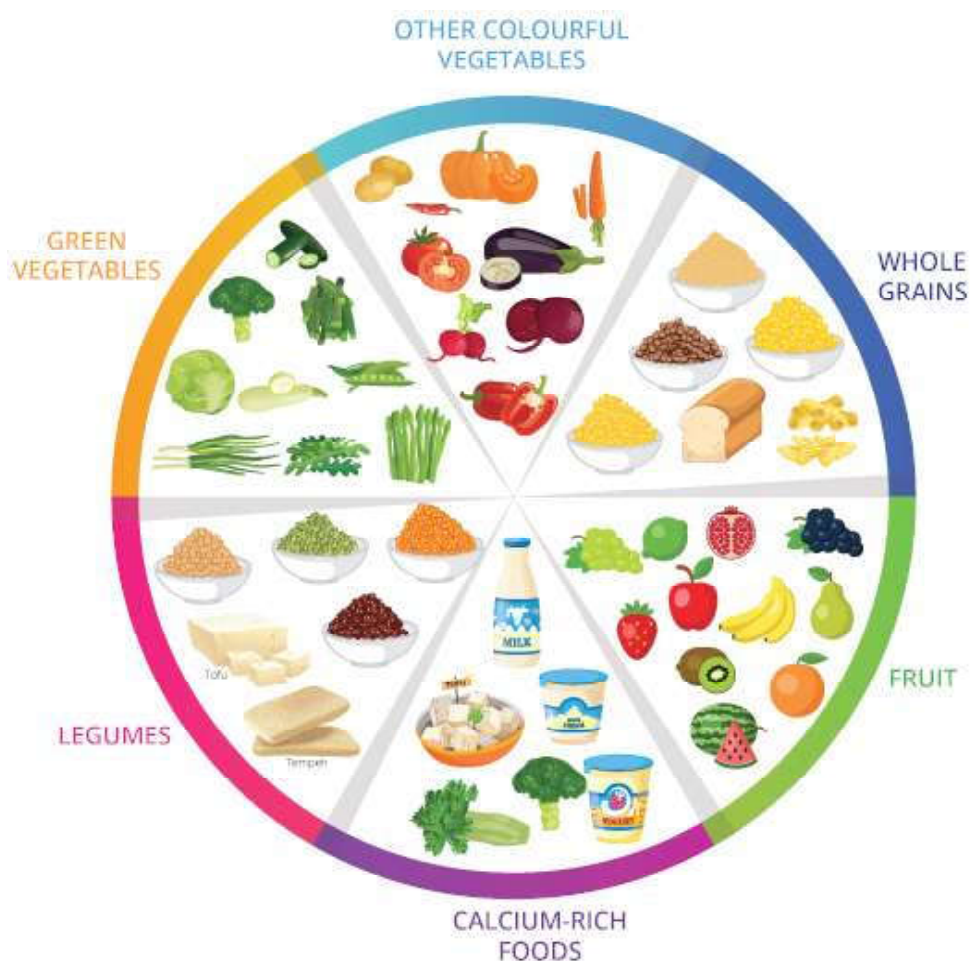


each and every meal includes foodstuff from all groups like energy giving, body building and protective/regulatory groups.

Differences in age, gender, weight, height, type and level of activity of an individual determine the balance diet. As infant needs more protein as compared to an adult. Similarly, the nutritional requirement of a female is different from that of a male due to their physiological functioning. Each and every factor is important while deciding the nutritional requirements for an individual.

Hence, a balanced diet is the consumption of an appropriate variety and adequate quantity of foods as well as beverages. A balanced diet provides nutrition and energy for the maintenance of body organs and it also helps in the normal growth and development of individual.

“A balanced diet is the foods and drinks which contains the appropriate blend of all nutrients required for normal growth and function of an individual”.



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DO YOU KNOW?

Your body will let you know if you are eating correctly. If overfed, you will start putting weight. If underfed, it won't have enough strength to fight disease and recover from illness.



Activity 6.3

- List any three food items that you eat daily and make a table containing nutrients available, functions and health benefits of those items.

6.3 FACTORS AFFECTING DIET

Everybody needs a balanced diet irrespective of their differences but there are certain factors which influence the choices in one's diet. One should consider the following factors while planning a diet for good health and fitness.

6.3.1 Age

Our need for the food and nutrients we must consume varies with age. An infant relies on mother's milk for food but with growing age extra food is required. Extra nourishment is required for adolescents due to their faster growing rate. During this age their food preferences are also influenced by friends and media rather than their nutritional requirement. That is why a proper dietary guidance is required for adolescence. Food can be prepared in the form they enjoy the most. Elders have difficulty in chewing, swallowing and digesting food; they need foods which can be easily digested and are soft.

6.3.2 Gender

The requirement of an individual differs on the basis of gender as well. Till the age of 10 years the requirement of nutrition is same in men and women whereas when they grow older the anatomy and physiology start to change like changes in height, weight and fat cells which leads to different nutritional requirements for men and women. Females need more iron due to blood loss during menstruation, and failure to take in enough iron can lead to problems like anaemia. Requirement of nutrition also changes for pregnant women and lactating women.



**Note**

6.3.3 Physical Activity

Requirements of nutrients and energy vary according to the physical activity of an individual. People with a sedentary lifestyle need less energy as compared to people with a heavy physical work lifestyle. People who indulge in physical activity require more energy. Intensity and duration of activity also affects the requirement of energy and type of diet. A person running a marathon will have a different diet requirement as compared to a sprint runner. An athlete competing in a body building competition will require more protein as compared to hockey players. Thus, it can be stated that physical activity determines the diet of an individual.

6.3.4 Physiological State

Physiological state of an individual also determines the type of diet an individual must take. Requirements of food for infants, during childhood and adolescence, for pregnant and lactating women are high due to the higher rate of growth and development. For example, a sedentary women need 1900 kcal of energy whereas, a lactating women will require between 2420 kcal to 2500 kcal of energy for healthy functioning. A person with high blood sugar levels will have to avoid foods that contains high amounts of sugar. Careful selection of food helps in prevention of obesity, malnutrition and illness. Food preferences of an individual are also affected by physiological state.

6.3.5 Economic Considerations

The price of the food may also vary from place to place. The cost of food items can also affect their selection. Some foods are more expensive than others despite having similar nutritional benefits. Seasonal and local food should be preferred.

6.3.6 Time and Skill

The dishes that are prepared in a diet depends on the skill of the cook and the availability of time for cooking. Lack of any of these can affect the quality of the meal. Lack of time may lead to a meal prepared in a hurry which might affect the taste as well as the nutritional value of the food. Lack of skill while preparing a meal may lead to loss of nutrition from the food while preparing it.

6.3.7 Region, Religion and Culture

Eating habits are affected by the region one belongs to and so are the dishes that are prepared in the diet. In Uttar Pradesh, for example, chapatis are more commonly consumed than rice while in Kerala rice and coconut are staple ingredients in a diet. Food habits are also influenced by religion. Some communities do not eat onion, garlic, eggs etc. Foods are also associated with festivals and every region and community has specific food choices.



**Note****6.3.8 Food Preferences of Individuals**

When it comes to a diet an individual takes, food preference play a very vital role. The dishes made are dependent on the preference of the individual. People from north India can occasionally enjoy idli sambar but on a regular basis they prefer to have dal roti. A non-vegetarian will prefer different food items than a vegetarian. If the preferred food is not given to an individual for a long period of time it may lead to under-eating, malnutrition, and other related problems.

6.3.9 Sensory Appeal

Senses play a very important role in selection of food for the diet. Aromatic and tastefully presented food is liked by everyone. Taste, flavour, texture, temperature, all are factors affecting the food acceptance of an individual. Sometimes sound of food also attracts an individual like popping of popcorn or crunchy sound of papad. All these are meant to satisfy our sensory organs i.e., tongue, nose, eyes and ears.

6.3.10 Media and Advertisement

Advertisement and media plays a very vital role in our choices. We eat what we see and that affects our whole diet. Media advertises food in such a way that it attracts many people. People tend to follow the diets that are advertised. Recently food blogging has increased the consumption of fast foods as they present the food in very attractive manner.

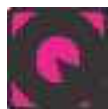
6.3.11 Accessibility and Transport

Foods that are easily accessible are frequently selected for the meal. Natural disasters like heavy rainfall, cyclones and droughts also affects the food supply which limits the food choices. Home delivery and online purchases have improved access to food in cities but in villages people have to eat whatever is currently accessible to them.

**Activity 6.4**

- Note down the foods that you have started to eat because you got attracted by an advertisement. Write a note on what attracted you in the advertisement.
- Make a list of foods that are prepared specifically for a festival.





Intext Questions 6.2

1. Tick (✓) the correct option.

1. How does age influence dietary needs?
 - a. Nutritional requirements remain the same throughout life
 - b. Adolescents require less food than infants
 - c. Elders may need food that is easier to chew and digest
 - d. Infants and elders require the same type of food
2. Which of the following factors affects diet based on physical activity?
 - a. People with sedentary lifestyles need more energy
 - b. Athletes require fewer proteins compared to non-athletes
 - c. Physical activity level determines energy and nutrient needs
 - d. Physical activity has no effect on dietary requirements
3. How do media and advertisements influence food choices?
 - a. They have no impact on people's diet
 - b. People are more likely to consume foods they see advertised attractively
 - c. Media prevents people from making unhealthy food choices
 - d. Advertising reduces the importance of food preferences



TERMINAL EXERCISE

1. Define, nutrition and elucidate on its components.
2. Write a detailed note on nutrients and its types.
3. Explain the concept of balanced diet.
4. Write three main functions of water.
5. What is the basic difference between macronutrients and micronutrients?
6. The nutritional requirements of each of your family members would be same or different? Give reasons.



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ANSWER OF INTEXT QUESTIONS

6.1

- 1) a) Carbohydrates, Proteins, Fats, Vitamins, Minerals, Water, and Fiber
- 2) b) It provides the body with essential nutrients for growth, repair, and energy
- 3) d) Number of hours spent watching TV
- 4) a-ii & v, b- i & iii, c- iv & vi.
- 5) A-Fat soluble, B- Water soluble, C- Water soluble, D- Fat soluble, E- Fat soluble, K- Fat soluble

6.2

- 1) c Elders may need food that is easier to chew and digest
- 2) c. Physical activity level determines energy and nutrient needs
- 3) b. People are more likely to consume foods they see advertised attractively

