

Chapter

1

Basic nutrition

As a part of continuation of the Home science 11th text book students are presented with 12th standard text book, in which adequate representation is given for nutrition, diet, foods, textiles etc. in which the starting lesson is Basic nutrition. The students are already aware of the concepts of Basic nutrition from their high school classes itself. In this chapter, we are introducing the basic concepts of nutrition. After learning this chapter the students will get a basic idea about nutrition, its classification, functions, sources, deficiency diseases and importance of dietary fibre and water. After completing this chapter, students will be able to identify foods according to its nutritional importance and can recognize the harmful effects of inadequate intake of nutrients.

Values and attitudes

After completing the Unit the learner :

- Develops positive attitude towards the importance of healthy food habits
- Develops a positive attitude towards the importance of including all food stuffs in our daily diet.
- Develops a right attitude towards the importance of water and dietary fibre in the diet.

Unit Frame

Concepts/Ideas	Process/Activity with assessment	Learning Outcomes
1.1 Nutrition-terms and definitions <ul style="list-style-type: none"> • Observing • Communicating and understanding the communication by others • Inferring • Making operational definition 	<ul style="list-style-type: none"> • General discussion based on internet reference on the definitions of health, nutrition, mal nutrition, optimum nutrition, under nutrition and over nutrition and preparation of note 	Recognises and defines health, nutrition, mal nutrition, under nutrition and over nutrition
1.2 Nutrients- functions, effect of deficiency and sources <ul style="list-style-type: none"> • Observing • Communicating and understanding the communication by others • Inferring • Classifying 	<ul style="list-style-type: none"> • General discussion based on internet reference and preparation of chart on the classification of carbohydrate, protein, fat, vitamins and minerals and preparation of note. • Group discussion on functions, effect of deficiency and sources of different nutrients and preparation of report • Preparation of recipes involving different nutrients and calculating its nutritive value • Preparation of notice on the importance of drinking adequate amount of water 	Classifies nutrients and differentiates their functions and sources and describes the effects of deficiency of various nutrients

1.3 Importance of dietary fibre <ul style="list-style-type: none">• Observing• Communicating and understanding the communication by others• Inferring	<ul style="list-style-type: none">• Group discussion on the importance of dietary fibre and preparation of report	Explains the importance of dietary fibre
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Unit analysis

1.1 Nutrition Terms and definitions

Sub concept: Dimensions of Health, Food, Nutrition

Suggested activity: *General discussion based on internet reference*

Teacher introduces the topic through a general discussion and ask them to observe figure 1.1 in the text book page no. 8 and to find interpretation regarding different dimensions of health depicted in the figure.

Discussion Points:

- What are the different dimensions of Health?
- What is the importance of classifying dimensions of Health?
- How can we define food?
- Differentiate between Food and Nutrition?

Teacher also asks to prepare a note on the definition of health and nutrition as given by WHO after visiting the website of WHO. After the discussion teacher consolidates the points and the students prepares note in their activity log.

Consolidation points

- Dimensions of Health
- Definition of food, health and nutrition

Sub concept: Optimum nutrition, Malnutrition

Suggested activity: *Group discussion*

Teacher initiate as a general discussion by asking whether they are healthy or not. Ask them to list how they are arriving at the conclusion that they are healthy. For this purpose ask them to group and discuss the points.

Discussion points

- How can we arrive at a conclusion that we are healthy? What is required for us to get a standard health?
- What are the signs of optimum nutrition?
- What happened to us if optimum nutrition is not obtained?

During discussion leaflets from health clubs, primary health centres etc based on malnutrition or books of malnutrition may be supplied in groups to facilitate reference based discussion. As an assignment ask them to refer internet to get information on different types of under nutrition and over nutrition. Also ask them to check themselves whether their nutrition is optimum or not.

Consolidation Points

- Optimum nutrition
- Signs of optimum nutrition
- Malnutrition – over nutrition, under nutrition

1.2 Nutrients- Functions, effects of deficiency and sources

Sub concept: Nutrients - Classification, carbohydrates

Suggested activity: *General discussion and internet reference, Preparation of Charts.*

Teacher introduces the topic through a general discussion and asks them to observe Table 1.1 in the text book page no. 11 and try to answer the given question. With the help of a Power Point illustrates the classification of carbohydrates.

Also ask them to identify what are the major nutrients and what are the minor nutrients?

Discussion Points:

- What is mean by nutrients?
- Why nutrients are classified in to micro and macro nutrients?
- What are the different types of carbohydrates?
- What is the difference between mono, di and poly saccharides?
- What are the functions of Carbohydrates?
- What are the sources of carbohydrates?
- What happen if adequate carbohydrates are not obtained?

Teacher also asks to prepare an organisation chart on the classification of carbohydrates and asked to list food items which contain carbohydrates with the help of internet and other health magazine references.

After the discussion teacher consolidates the points and the students prepares note in their activity log.

Consolidation points

- Nutrient- definition
- Types of nutrients, Carbohydrates
- Classification of carbohydrates- Mono saccharides, Disaccharides, Poly saccharides
- Functions of carbohydrates
- Sources of carbohydrates

Sub concept: Proteins

Suggested activity: *General discussion , Preparation of Charts*

Teacher introduces the topic through a general discussion and ask them think which nutrient is needed for our growth. With the help of a Power Point illustrates the classification of Proteins. Asked to read the newspaper cutting related to the deficiency of nutrients then observing the figures given in text 1.2 in page no. 19 and 1.3 page no. 20 and asked to list the symptoms of the diseases.

Discussion Points:

- What are the different types of Proteins?
- What is the difference between complete, partially complete and incomplete proteins?
- What are the functions of Proteins?
- What are the sources of proteins?
- What happen if adequate proteins and carbohydrates are not obtained?

Teacher also asks to prepare a chart on the classification of Proteins and asked to list food items which contain proteins with the help of internet and other health magazine references.

Also asked to collect notes regarding the deficiency diseases- Kwashiorkor and Marasmus.

After the discussion teacher consolidates the points and the students prepares note in their activity log.

Consolidation points

- Proteins
- Classification of Proteins
- Functions of Proteins
- Sources of Proteins

TEACHER INPUTS**Iatrogenic Kwashiorkor****Kalyani Pillai and Sandhya Acharya***

Departments of Pediatrics and *Dermatology, Amala Institute of Medical Sciences, Thrissur, Kerala, India.

We report four cases of kwashiorkor in infants, who had a pre existing skin disorder and who were on dietary restrictions as part of their treatment in Alternative medicine.

Complementary and alternative medicine are increasingly being used to diagnose or treat allergic diseases, and numerous studies have reported benefits of this type of medicine. However, severe nutritional deficiencies can occur in infants and small children given strict alternative diets, leading to 'kwashiorkor'(1). These four cases, three of whom had atopic dermatitis and one had epidermolysis bullosa, presented with generalized edema, skin peeling, hair changes, apathy, and not gaining weight. On examination, three of these cases had kwashiorkor and one had marasmic kwashiorkor. Investigations supported the diagnosis. In all these cases, the nutritional deficiencies were caused by severe dietary restriction placed by the treating alternative medicine. The ratio of protein to energy in this diet is very low as most forms of protein are taboo in this diet(1). For example, cow's milk and milk products except ghee, pulses and oils as they are "gas forming", Ragi and most fruits as they are "cold food", were restricted. It is this imbalance in the dietary ratio of protein to energy that has been implicated in the pathogenesis of kwashiorkor(2). The families involved do not fit the stereotypic profile in which malnutrition would be anticipated. The parents were well-educated, seemed knowledgeable and responsible, and had at least average family income. Diagnoses were delayed by a low index of suspicion as the skin changes of kwashiorkor were thought to be an exacerbation of the primary skin problem.

In addition, kwashiorkor is uncommon in Kerala, and as a result, physicians may be unfamiliar with their clinical features. With resumption of a proper diet, the edema subsided in two weeks and skin changes were reversed, though the primary skin lesions persisted.

We were unable to find previous reports of kwashiorkor caused by dietary restriction as a part of treatment in alternative medicine, but cases may have occurred and may have not been reported. A heightened level of vigilance is required so that nutritional deficiency, which may result in severe life-threatening complications, is not overlooked.

Acknowledgment

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References

1. Niggemann B, Gruber C. Side-effects of complementary and alternative medicine. *Rev Allergy* 2003; 58: 707-716.
2. Rossouw JE. Kwashiorkor in North America. *Am J Clin Nutr* 1989; 49: 588-592.

Source : <http://www.indianpediatrics.net/june2010/june-540-541.htm>

TEACHER INPUTS

MARASMUS

Marasmus is a serious worldwide problem that involves more than 50 million children younger than 5 years. According to the World Health Organization (WHO), 49% of the 10.4 million deaths occurring in children younger than 5 years in developing countries are associated with protein-energy malnutrition. Various extensive reviews of the pathophysiological processes resulting in marasmus are available. Unlike kwashiorkor, the clinical sequelae of marasmus can be considered as an evolving adaptation in a child facing an insufficient energy intake. Marasmus always results from a negative energy balance. The imbalance can result from a decreased energy intake, an increased loss of ingested calories (eg, emesis, diarrhea, burns), an increased energy expenditure, or combinations of these factors, such as is observed in acute or chronic diseases. Children adapt to an energy deficiency with a decrease in

physical activity, lethargy, a decrease in basal energy metabolism, slowing of growth, and, finally, weight loss.

Pathophysiological changes associated with nutritional and energy deficits can be described as (1) body composition changes, (2) metabolic changes, and (3) anatomic changes.

Marasmus is more frequent in children younger than 5 years because this period is characterized by increased energy needs and increased susceptibility to viral and bacterial infections. Weaning, which occurs during this period, is often complicated by factors such as geography (eg, drought, poor soil productivity), economy (eg, illiteracy, unemployment), hygiene (eg, access to quality water), public health (eg, number of nurses is more than number of physicians), and culture and dietetics (eg, intrafamily distribution of high-nutrition foods).

Source : www.emedicine.medscape.com/article/984496-overview

Sub concept: Lipids

Suggested activity: *General discussion , Preparation of Charts and poster*

Teacher introduces the topic through a general discussion and asks them think which are the oils/lipids that we use in our kitchen. With the help of a Power Point illustrates the classification of Lipids. Ask to read the article 'killer fat' in the text book page no. 23 and identify the problems of the excessive use of fats.

Discussion Points:

- What are the different types of Lipids?
- What is the difference between simple, compound and derived lipids?
- What are the functions of Lipids?
- What are the sources of Lipids?
- What happen if excess fat/oil is consumed?

Teacher also asks to prepare a chart on the classification of Lipids and asked to list food items which contain lipids with the help of internet and other health magazine references. Also asked to collect notes and prepare a poster regarding the problems of excessive use of fats and oils.

After the discussion teacher consolidates the points and the students prepares note in their activity log.

Consolidation points

- Lipids
- Classification of Lipids
- Functions of Lipids
- Sources of Lipids
- Problems caused by excess use of lipids

Sub concept : minerals

Suggested activity : Group discussion

Teacher introduces the topic through a general discussion and ask them to think what are minerals? Do they have any role in our body?. With the help of a Power Point illustrates the different major mineral elements.

Discussion Points:

- What are the different types of minerals?
- What are the functions of minerals in our body?
- What are the sources of minerals?
- What are the conditions of deficiency of different minerals?

Teacher also asks to prepare a chart on the functions, sources and effects of deficiency of different minerals with the help of Text Book, internet and other health magazine references. Also asked to conduct self evaluation by completing the following figure.

SELF EVALUATION



After the discussion teacher consolidates the points and the students prepares note in their activity log.

Consolidation points

- Minerals
- Different minerals
- Functions of minerals
- Sources of minerals
- Problems caused by deficiency of minerals.

TEACHER INPUTS**Need for early detection of osteoporosis stressed**

The Association of Spine Surgeons of India (ASSI) have stressed the need for early detection and timely treatment of osteoporosis, the high incidence of which is emerging as a major cause of concern in the country. About 20 per cent of women and about 10 to 15 per cent of men above the age of 50 years in India were osteoporotic. Yet, the condition continued to be under-diagnosed and inadequately managed, ASSI pointed out on the occasion of World Osteoporosis Day on October 20.

ASSI had been trying to create awareness about this condition among the general public as osteoporosis is the leading cause of fractures of the spine, hip, and the wrist among the elderly. Women were four times more susceptible to this condition than men. An estimated nine million new osteoporotic fractures occurred every year, including 1.4 million vertebral fractures. Apart from pain and immobility, these fractures had other long-term consequences including functional and psychosocial impairments, poor pulmonary function, and risk of further fractures. Recent studies had indicated that 32 per cent of hip fractures in the elderly were due to osteoporosis.

Bone mineral density test could detect early osteoporosis, help predict chances of fracture, and determine rate of bone loss. Doctors recommend that any individual with recent fractures, all post-menopausal women, and men over 50 years should undergo this test.

Doctors said that the lower age at which the peak incidence of osteoporosis is occurring in India was also a matter of concern. In Western nations, the peak incidence of osteoporosis was at 70-80 years of age, while in India, this was significantly lower at 50 to 60 years of age. Doctors pointed out that there was no complete cure for osteoporosis and that it was difficult to rebuild weakened bones. Hence, the accent should be on prevention. Lifestyle changes, including

a balanced diet with adequate calcium and Vitamin D intake, exercise, and staying away from tobacco and limiting alcohol consumption could help prevent osteoporosis, doctors said. According to Cherian Thomas, eminent Orthopaedician, stocking up on calcium stores in the younger age can give significant results in preventing osteoporosis later in life.

Source <http://www.thehindu.com/todays-paper/tp-national/tp-kerala/need-for-early-detection-of-osteoporosis-stressed/article2557547.ece>

Sub concept : Vitamins

Suggested activity: *General discussion, using internet reference and Preparation of Charts.*

Teacher introduces the topic through a general discussion and ask them to think what are vitamins? Do they have any role in our body? With the help of a Power Point illustrates the different types of vitamins. A class Seminar based on the topic “Nutritional importance of Vitamins” can be conducted in groups.

Discussion Points:

- What are the different types of vitamins?
- What are the functions of vitamins in our body?
- What are the sources of vitamins?
- What are the conditions of deficiency of different vitamins?

Teacher also asks to prepare a chart on the functions, sources and effects of deficiency of different vitamins with the help of Text Book, internet and other health magazine references. Also asked to conduct peer evaluation by completing the following figure.

PEER EVALUATION



After completing the activities teacher consolidates the points and the students prepares notes in their activity log.

Consolidation points

- Vitamins
- Different types of vitamins
- Functions of vitamins
- Sources of vitamins
- Problems caused by deficiency of vitamins

Teacher Input**Phrynoderma: a manifestation of vitamin A deficiency?... The rest of the story.**

Phrynoderma is a distinctive form of follicular hyperkeratosis associated with nutritional deficiency. Although originally thought to represent vitamin A deficiency, several studies have demonstrated multiple etiologies. Characteristic skin lesions are hyperkeratotic papules that first appear on the extensor surfaces of the extremities, shoulders, and buttocks. We report a 14-month-old boy with malnourishment and hyperkeratotic papules and plaques with histologic changes typical of phrynoderma. Despite an extensive evaluation, a specific nutritional deficiency was not identified. Phrynoderma is believed to be a manifestation of severe malnutrition, not necessarily accompanying low vitamin A levels. While the literature supports a link between phrynoderma and vitamins E, B, A, and essential fatty acids general malnutrition seems to be the strongest association. The clinical picture typically improves with enhanced nutritional status. Phrynoderma must be considered in the differential diagnosis in patients with extensor surface hyperkeratotic papules and plaques in the setting of malnourishment and should prompt the clinician to evaluate cell markers of nutritional status, not just vitamin A. We believe this patient exemplifies the conundrum that faces clinicians in evaluating patients with extensor surface predominant hyperkeratotic papules and plaques in the setting of malnourishment.

Source: <http://www.ncbi.nlm.nih.gov/pubmed/15660900>

Teacher Evaluation

Ask students to complete the table

Vitamins	Sources	Functions	Deficiency diseases	Strategies adopted to correct wrong answers produced

After adopting the strategies to rectify the wrong answers ask students to complete the table given in Text Book page no. 37.

Sub concept: Water

Suggested activity: *General discussion, and Preparation of notice.*

Start the class with the question related to consumption of water per day and with the help of general discussion leading to the importance of water in our body. Teacher also ask students to analyse Table 1.4 of Text book page no.39.

Discussion Points

- What should be the daily consumption of water?
- What are the roles of water in our body?
- What is the role of kidney and lungs in water regulation in our body?
- What are the functions of water in our Body?
- What are the disease conditions related to Water?

Teacher also ask to prepare an awareness notice after referring internet showing the importance of drinking adequate amount of water and circulate among the students of other subjects.

Consolidation Points

- Amount of water to be consumed per day
- Role of Water in our body

- Role of skin, lungs and Kidneys in Water regulation
- Functions of water in our Body
- Diseases condition related with Water – Oedema, Dehydration

1.3 Importance of dietary fibre

Suggested activity: *Group discussion*

Teacher initiates the discussion by asking the role of salads in daily diet. The discussion should lead to different types of dietary fibres their importance, good sources of fibres and functions of fibres.

Discussion Points

- What are the roles of dietary fibres?
- What are the differences between soluble and insoluble fibres?
- What are the functions of dietary fibres?

Also ask them to prepare a report based on the group discussion and consolidates the topic based on the following points

Consolidation Points

- Role of Dietary fibres
- Two types of Dietary fibres
- Functions of fibres in our body

Items for continuous evaluation

a. Process assessment

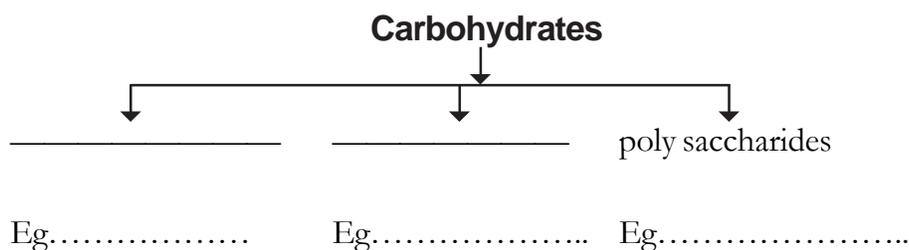
- General discussion based on internet reference on the definition of health, nutrition, optimum nutrition, malnutrition, under nutrition and over nutrition.
- Preparation of chart on the classification of carbohydrates, proteins, fat, vitamins and minerals.
- Preparation of recipes involving different nutrients and calculating its nutritive value.
- Group discussion on functions, effect of deficiency and sources of different nutrients.
- Preparation of recipes involving different nutrients and calculating its nutritive value.

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- Preparation of notice on the importance of drinking adequate amount of water
- Group discussion on the importance of dietary fibre
- b. Portfolio assessment**
 - Note on the definition of health, nutrition, optimum nutrition, malnutrition, under nutrition and over nutrition
 - Preparation of recipes involving different nutrients and calculating its nutritive value
 - Report on functions, effect of deficiency and sources of different nutrients.
 - Preparation of recipes involving different nutrients and calculating its nutritive value
 - Preparation of Notice on the importance of drinking adequate amount of water
 - Report on the importance of dietary fibre
- c. Unit assessment**
 - Unit test
 - Oral test
 - Open book assessment
 - Preparation of questions and writing answers

Sample Term end Questions

1. State the dimensions of health.
2. Differentiate optimum nutrition and malnutrition.
3. Complete the following flow chart and give examples for each category



4. Choose the correct statement from the following
- Sucrose is also known as invert sugar
 - Fructose is known as table sugar
 - Glucose is known as milk sugar
 - Galactose is known as malt sugar
5. Sources of different nutrients are given below. Analyse them and complete the following table .

(Butter, Cereals, Sugar and jaggery, Meat, Eggs, Roots and tubers, Milk, Cheese, Fish liver oil)

Carbohydrates	Protein	Fat

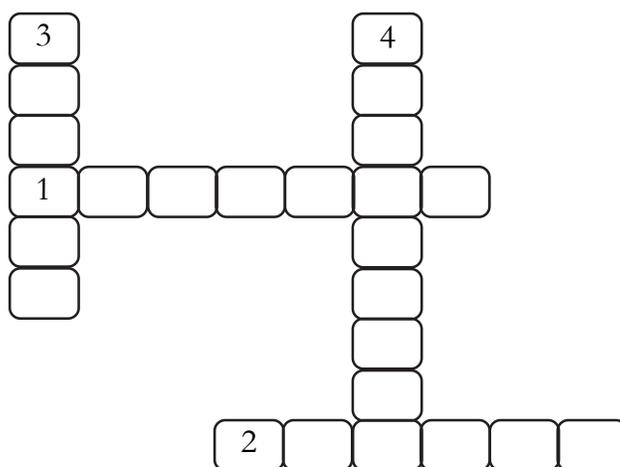
6. Compare osteoporosis and osteomalacia.
7. Complete the puzzle

Across: 1. Effect of deficiency of iron

2. Effect of deficiency of iodine

Down: 3. Effect of deficiency of calcium

4. Effect of deficiency of thiamine



8. Analyse the symptoms of infantile scurvy and adult scurvy
9. Evaluate the effects related to water in our body
10. Select sources of soluble fibre from the following
Apple, Wheat bran, Banana, Whole grain cereals

Hyper links:

en.wikipedia.org/wiki/Kwashiorkor

<http://www.medicinenet.com/script/main/art.asp?articlekey=4124>

<http://www.healthgrades.com/conditions/kwashiorkor>

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Chapter

2

A guide to Healthy Living

In the previous chapter we have discussed about different nutrients and its importance in our diet. This chapter will help the students to have a healthy life, be active, eat food that is good for you and feel OK about yourself. When one eats healthy foods one feels better, have more energy, can lose weight and move easier. Eating healthy foods is a way of taking care of yourself. After completing this chapter the students will get a clear concept about the classification of food, food pyramid, different cooking methods, loss of nutrients during cooking, healthy food habits and methods of enhancing nutritive value of foods.

Values and attitudes

After completing the Unit the learner :

- Develops a positive attitude towards healthy living
- Develops confidence in changing dietary habits

Unit Frame

Concepts/Ideas	Process/Activity with assessment	Learning Outcomes
2.1 Classification of food <ul style="list-style-type: none"> • Observing • Communicating and understanding the communication by others • Inferring • Making operational definition Classifying	<ul style="list-style-type: none"> • Group discussion on the classification of food and preparation of report 	Classifies food based on its functions its keeping quality and based on various food groups
2.2 Food pyramid <ul style="list-style-type: none"> • Observing • Communicating and understanding the communication by others • Inferring • Making operational definition • Classifying 	<ul style="list-style-type: none"> • General discussion on food pyramid and preparation of note 	Identifies and explains food pyramid
2.3 Cooking- objectives, principles and methods <ul style="list-style-type: none"> • Observing • Communicating and understanding the communication by others 	<ul style="list-style-type: none"> • Group discussion on different cooking methods and preparation of report • Preparation of food stuffs using different cooking methods and preparation of report 	Evaluates different cooking methods

<ul style="list-style-type: none"> • Inferring • Making operational definition • Classifying 		
<p>2.4 Loss of nutrients and steps to minimize nutrient loss</p> <ul style="list-style-type: none"> • Observing • Communicating and understanding the communication by others • Inferring 	<ul style="list-style-type: none"> • Group discussion on loss of nutrients and steps to minimize nutrient loss and preparation of report 	Evaluates the loss of nutrients and steps to minimize nutrient loss during preparation and cooking
<p>2.5 Healthy food habits-General guidelines and junk foods</p> <ul style="list-style-type: none"> • Observing • Communicating and understanding the communication by others • Inferring 	<ul style="list-style-type: none"> • General discussion on healthy food habits ,its general guidelines and harmful effects of junk foods and preparation of note • Preparation of notice about healthy food habits 	Explains healthy food habits
<p>2.6 Methods of enhancing nutrient availability</p> <ul style="list-style-type: none"> • Observing • Communicating and understanding the communication by others • Inferring • Making operational definition • Classifying 	<ul style="list-style-type: none"> • General discussion on methods of enhancing nutrient availability and preparation of note • Collection of more details about different kinds of foods, its method of cooking and methods of enhancing nutrient availability from internet and preparation of report 	Distinguishes different methods of enhancing nutrient availability

Items for continuous evaluation

a. Process assessment

- Group discussion on the classification of food.
- Group discussion on different cooking methods.
- Preparation of food stuffs using different cooking methods.
- Group discussion on loss of nutrients and steps to minimize nutrient loss.
- Preparation of notice about healthy food habits.
- Collection of more details about different kinds of foods, its method of cooking and methods of enhancing nutrient availability from internet.

b. Portfolio assessment

- Report on the classification of food.
- Report on different cooking methods.
- Preparation of food stuffs using different cooking methods.
- Report on loss of nutrients and steps to minimize nutrient loss.
- Preparation of notice about healthy food habits.
- Report on different kinds of foods, its method of cooking and methods of enhancing nutrient availability.

c. Unit assessment

- Unit test.
- Oral test.
- Open book assessment.
- Preparation of questions and writing answers.

Sample Term end Questions

1. Classify foods based on its functions and explain.
2. Analyse the nutrients contributed by group III and IV of ICMR classification of food.
3. Illustrate food pyramid.

4. Analyse the food preparation given below and explain the principle of cooking applied.
 - a) Cutlet
 - b) Mixed vegetable stew
5. Examine the food preparation given below and identify the method of cooking employed and list the advantages and disadvantages of the method.
 - a) Bread
 - b) Egg pakoda
6. Nutrients are lost while cooking. Evaluate.
7. Discuss the conservation of nutrients.
8. Suggest any three guidelines for a healthy living.
9. Critically evaluate the harmful effects of junk foods.
10. Choose the correct statement from the following.
 1. During fermentation the food becomes porous, light and digestible.
 2. Fortified food contains macronutrients.
 3. Combination provide an ill balanced diet.
 4. Germination decreases niacin, riboflavin and folic acid content.

Hyper Links:

<http://www.helpguide.org/articles/healthy-eating/healthy-eating.htm>

http://agritech.tnau.ac.in/nutrition/nutri_cookingtips_nutrientloss.html

<http://www.nutritionvista.com/NutritionBuzz/preventing-nutrient-loss-during-cooking,236.aspx>