



Central School

Home School Package

Year : 9







Subject : Basic Science

HOME SCHOOL PACKAGE CONTENT

This package contains 9 lesson plans. These 9 lesson plans are scheduled for 3 weeks, which are weeks 6, 7 and 8 of term 2.

Students are expected to do 3 lessons per week, so that they can be able to finish all the work in the 3 weeks.

LESSON Plan

 Teacher	Name : Nae Natapei Subject : Basic Science
 Date	
	Topic : The Human Body- Nutrition Lesson number : 1 - Food Nutrients
 Learning outcomes	<ul style="list-style-type: none">• Name the different categories of food nutrients that the body needs.• Outline the different needs of the body which are met by the different nutrients.• List examples of foods which contain the different nutrients.
 Introduction	<p>Your body needs to be constantly supplied with food in order to keep it working. The food you eat has three main jobs to do for the body.</p> <p><i>What are three main jobs that food does for your body?</i></p> <p>These jobs are done by the different nutrients that are found in food, and different foods contain different types of nutrients.</p>
	<u>Catch phrase for the lesson</u>



Learners notes

Summary

SECTION 4: NUTRITION AND DIGESTION

1. NUTRITION

Nutritional Needs of the Body

For a truck to run, it needs fuel (petrol/benzene or diesel). The fuel supplies the energy to make the car go. Your body also needs fuel to keep it working. Its fuel is the food you eat.

Food has three main jobs to do in your body: provide energy, make new cells for growth and repair, and provide vitamins and minerals to keep you healthy. These jobs are done by different kinds of foods.

(1) Carbohydrates are sugary & starchy foods like kumala, bread, rice, cakes & biscuits. They give your body fuel for energy. You need energy to work your muscles & all other organs.

(2) Fats & Oils can also be used by the cells to produce energy. They give twice as much energy as other foods. They can be stored in the body for warmth & future use. Milk, chocolate, cheese, nuts, margarine & oil contain a lot of fats & oils.

(3) Proteins are body building foods. You need proteins to make new cells for growth & repair. Your body grows by forming new cells. You also need new cells to replace dead ones. Protein are also used to make enzymes. Enzymes are found in all living cells & help their chemical reactions to work. Foods like beans, eggs, meat, fish & milk contain a lot of protein. Figure 25 shows some of the foods in each of these 3 food groups.

(4) Vitamins & Minerals are needed in small amounts for your body to stay healthy (to maintain the chemical processes of the body). Different vitamins & minerals are needed for many different jobs in your body. Figures 26 a) & b) show some of the minerals & vitamins needed in your diet, what they are needed for & which foods contain them.

(5) Fibre is found in fresh fruit & vegetables, wholemeal cereals & breads & bran. You cannot digest dietary fibre but it prevents constipation & cleans your bowels. The muscles of your digestive system can grip food with fibre in it easier than soft food.

(6) Water is not a food but we cannot live for long without it. Water is needed for:

- all the chemical reactions in your body
- making new cells (cytoplasm)
- digestion & transport nutrients around your body.

We lose about 1L of water each day in urine & sweat. This water must be replaced by drinking & eating food which has water in it.

Most foods are mixtures of the different food types, but different foods are very different mixtures. Some foods are mostly made up of carbohydrates (like bread), some of fat (like margarine) & so on.

Figure 25. Foods in three of the main food groups



Fig. 26 a): Minerals needed in your diet









Mineral	These foods contain a lot of the mineral	What the mineral does in your body
Iron	Meat, liver, eggs, peas and beans 	You need it to make haemoglobin, the red substance in blood. Too little iron in your diet causes <i>anaemia</i> .
Calcium and phosphorus	Milk, cheese and fish 	You need these for the growth of bones and teeth.
Sodium chloride (or common salt)	Table salt, bread, cheese, bacon and biscuits 	You need it to make blood plasma (the liquid part of blood) and to help your nerves to work properly.
Iodine	Sea food such as winkles, whelks, mussels and fish; watercress 	You need it to make the hormone thyroxine. This is made by the thyroid gland in your neck.

Fig. 26 b): Vitamins needed in your diet

Vitamin	These foods contain a lot of the vitamin	What the vitamin does in your body
A	Liver, cod-liver oil, green vegetables, carrots, milk, butter and margarine 	It helps cells to grow and keeps the surface of your body healthy, for example the skin and lining of your nose, throat and the cornea of your eyes. It helps your eyes to see in poor light. If you have too little of the vitamin you get skin infections and you cannot see well at night.
B This is a group of several different vitamins.	Liver, meat, eggs, yeast, green vegetables, milk and fish 	You need these vitamins to help your cells to grow and to keep your nerves and skin healthy. Too little of these vitamins causes dry skin, nervous troubles, poor growth and a deficiency disease called <i>beri-beri</i> . This disease affects the leg muscles which cannot then grow properly.
C This vitamin is destroyed by cooking, mincing or grating.	Green vegetables, potatoes, oranges, lemons, tomatoes, blackcurrants ('Ribena') 	You need this to keep your skin, teeth and gums healthy. It also keeps the linings of your blood vessels healthy. Too little of the vitamin causes a disease called <i>scurvy</i> in which gums go soft and your teeth become loose. Any wounds do not heal properly and your skin bleeds easily.
D This vitamin can be made in your body by sunlight acting on a substance in your skin.	Butter, cheese, eggs, fish, liver 	You need this to grow healthy bones and teeth. Too little of the vitamin causes a disease called <i>rickets</i> in which your bones go soft. Your leg bones cannot support the weight of your body and they bend.



Visual aids



Exercises

- Study the scanned notes above.

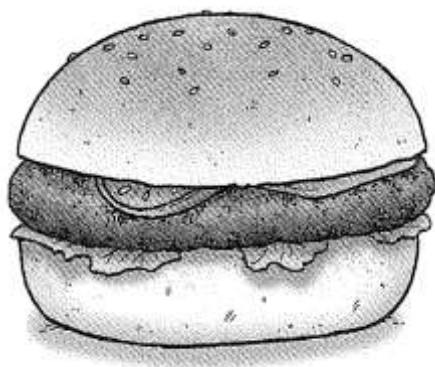
Activity 1

- Using the notes that you have studied, copy and complete the summary table below, by writing down what the different nutrients do for the body and examples of foods which are rich in the food nutrient.

Food group	What it does for the body	Examples of foods.
Carbohydrate		
Fats and oils		
Proteins		
Vitamins and minerals		
Fibre		
water		

Activity 2




1. Draw lines to join the bun, hamburger and cheese to the food group they belong to.









carbohydrates

fat

protein

 Assignment	
 Assessment	This topic will be assessed in the topic test.
 References	

LESSON Plan

 Teacher	Name : Nae Natapei Subject : Basic Science
 Date	
	Topic : The Human Body -Nutrition Lesson number : 2- Food Test
 Learning outcomes	<ul style="list-style-type: none">• Detect the presence of simple sugars, starch, fats, proteins in foods samples, using simple food tests.
 Introduction	<p>Jerry is sick and his doctor tells him to eat foods that contain a lot of protein, if he wants to recover quickly. So Jerry decides to sneak into Tom's house and steal cheese from Tom's kitchen, because he thinks that cheese contains a lot of protein. How can Jerry prove that cheese is rich in protein?</p> <p>To find out if a food contains carbohydrate (starch and sugar), protein or fat in it, a series of food tests can be performed, in the lab. Different tests will require different chemical reagents and will require you to follow different procedures.</p>
	<u>Catch phrase for the lesson</u>



Learners notes

Summary

Practical Exercise 16: Food Tests

You will need:

- for (a): starch solution, potato, bean bread, iodine solution, droppers, test tubes-
- for (b): glucose solution, carrot, onion, a sweet, Benedict's solution, glucose solution, droppers, test tubes, bunsen burner, matches, beaker, sugar, egg.
- for (c): mortar and pestle, ethanol, cooking oil, filter paper, funnel, beaker, test tube, droppers, peanut, cheese, sugar, egg white
- for (d): albumen solution, test tube, sodium hydroxide solution, 1% copper sulphate solution, milk, peanut, bean.

Methods:

Testing for carbohydrates

(a) Testing for Starch

1. Pour about 2 cm depth of starch solution into a test tube.
2. Add a few drops of iodine solution. The solution will go blue-black. This is a positive test for starch.
3. Now add a few drops of iodine solution to:
 - a) the cut surface of a potato
 - b) the cut surface of a bean
 - c) a small piece of bread.

Do these foods have starch in them?



(b) Testing for glucose (also called Benedict's test)

1. Pour about 2 cm depth of glucose solution into a test tube.
2. Add about 2 cm depth of Benedict's solution.
3. Boil the solution in a beaker of water (see fig. 27b) but point the mouth of the test-tube away from people. The blue solution will go red. This is a positive test for glucose.

4. Now do the Benedict's test with:
 - a) some mashed-up carrot
 - b) some mashed-up onion
 - c) a sweet.

Do these foods have glucose in them?

Try both of these tests on sugar and egg. Do they contain carbohydrate?

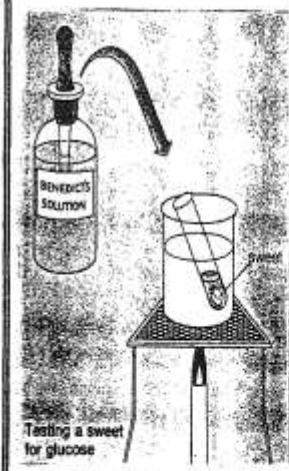














FIGURE 26a and FIGURE 26b

 Visual aids																								
 Exercises	<ul style="list-style-type: none">• Read the notes above.• In your exercise books, copy and complete the table below. <table><tr><th>Food nutrient tested for</th><th>Chemical reagent(s) used.</th><th>Method outlined</th><th>Positive test</th></tr><tr><td>Glucose (simple sugar)</td><td>Benedict solution</td><td><ol style="list-style-type: none">1. Put your food sample in a test tube.2. Add 2cm benedict solution.3. Place test tube, containing food sample and benedict solution, in a beaker of water.4. Heat up the beaker of water with the test tube containing the food sample and the benedict solution inside.5. Observe the colour changes that are taking place in the solution inside the test tube.</td><td>The solution in the test tube should change colour from Blue to red.</td></tr><tr><td>Carbohydrate</td><td></td><td></td><td></td></tr><tr><td>Fats and Oils</td><td></td><td></td><td></td></tr><tr><td>Protein</td><td></td><td></td><td></td></tr></table>				Food nutrient tested for	Chemical reagent(s) used.	Method outlined	Positive test	Glucose (simple sugar)	Benedict solution	<ol style="list-style-type: none">1. Put your food sample in a test tube.2. Add 2cm benedict solution.3. Place test tube, containing food sample and benedict solution, in a beaker of water.4. Heat up the beaker of water with the test tube containing the food sample and the benedict solution inside.5. Observe the colour changes that are taking place in the solution inside the test tube.	The solution in the test tube should change colour from Blue to red.	Carbohydrate				Fats and Oils				Protein			
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Carbohydrate																								
Fats and Oils																								
Protein																								
 Assignment																								
	Practical test with written lab report.																							

Assessment	
	
References	

LESSON Plan

 Teacher	Name : Nae Natapei Subject : Basic Science
 Date	
 Topic : The Human Body -Nutrition Lesson number : 3 – Balanced Diet	
 Learning outcomes	<ul style="list-style-type: none"> • Explain what is meant by ‘balanced diet’. • Construct a balanced meal from knowledge of available foods.
 Introduction	<p>A balanced diet is one that contains the right amounts of the right kinds of food (protein, carbohydrate, fats and oils, and vitamins and minerals) to satisfy your body needs, in order to keep your body healthy. Therefore it is very important that we always eat balanced meals to keep ourselves healthy.</p>
 Catch phrase for the lesson	
 <u>Summary</u>	

2. A BALANCED DIET

If you ate only sweets, or ice cream, or rice you would stay alive for a time. But you would not stay healthy, because you are not eating a balanced diet.

A balanced diet is one which contains the right amounts of protein, carbohydrate, fat, vitamins & minerals to satisfy all your body's needs. A diet which is balanced for one person may not be balanced for another. The amount of food you need depends on the energy you use in a day.

That depends on:

- (1) Your age - teenagers use more energy than babies
- (2) Your work - a copra-cutter uses more energy than a secretary.
- (3) Your sex - males use more energy than females of the same ages, even for the same work.
- (4) Your size - the bigger your build is the more food you will need to stay healthy.

The following table shows the amount of energy used in a day. (The units used are kilo-joules and are a scientific way to measure how much energy is in foods.)

PERSON	ENERGY USED IN ONE DAY (Kj)	
	MALE	FEMALE
child (age 8)	8800	8800
teenager (age 15)	12600	9600
adult (light work)	11500	9450
adult (heavy work)	20000	12600
pregnant mother		10000
breast-feeding mother		11300

The food you eat each day should supply just enough energy to get you through that day. If you eat too much, your body stores the extra as fat. So you get overweight. If you eat too little, you lose weight. You feel weak & have no energy.






Practical Exercise 17: Planning a Balanced Diet

Construct a balanced diet for one person for one day (three meals) using what you have already learnt & from the table given on the next page.








BASIC SCIENCE FOR VANUATU - FOOD TABLE

FOOD	ENERGY		GROWTH	PROTECTION			Minerals	
	Fat	Carbohydrate	Protein	Vitamins A	B	C	Iron	Calc.
White bread	*	****	**		*		*	**
White rice	*	****	**		*		*	*
Brown rice	*	****	**		**		***	*
Manioc		****	*		**	***	***	**
Taro/Yam		****	**		**	***	***	***
Kumala		****	**	***	**	***	***	***
Breadfruit		****	**	**	**	***	***	***
Peanuts	***	***	****		***			
Pigeon pea	*	***	****	**	**		****	***
Cheese twisties	***	***	*					**
Lean beef	***		****		***		***	*
Pork	****		****		***		**	*
Chicken	***		****		**		**	*
Liver	*	*	****	****	****		****	*
Tinned meat	***		****		**		**	**
Fish	*		****	*	*		*	*
Shell fish	*	*	****	*	*		**	**
Tinned fish & oil	***		****	*	*		**	***
Eggs	**		****	***	**		**	*
Whole milk powder	***	****	****	***	**	*		****
Margarine/Butter	****			****				
Cooking oil	****							
Coconut cream	****	*	*					
Sugar/Jam		****						
Soft drinks		***						
Fresh fruit juice		**		*	*	***	*	*
Drinking coconut		*	*		*	*	*	*
Island cabbage		*	**	****	***	***	***	**
English cabbage		*	*	**	*	**	*	*
Carrots/Pumpkin		*	*	****	***	**	*	*
Pawpaw/Mango		*	*	****	*	****	*	*
Eating banana		**	*	**	*	**	*	*
Apple		*	*	*	*	*	*	*
Coconut (dry)	****	**	*	*	*	*	*	*

**** Very good source *** Good source ** Moderate source * Poor source

 <p>Visual aids</p>	
 <p>Exercises</p>	<p>Study the given notes above and do the following activity answering the questions that follow.</p> <ol style="list-style-type: none"> 1. Design a balanced meal for a family dinner using our local foods. 2. Evaluate your meal. <ol style="list-style-type: none"> a) Does it contain the right proportions of carbohydrates, proteins and fats ? b) Does it provide vitamins and minerals ? c) Is it rich in fibre ? 3. How could you change your meal to make it more balanced ? 4. Explain what a balanced diet is.
 <p>Assignment</p>	
 <p>Assessment</p>	<p>This topic will be assessed in the topic test.</p>
 <p>References</p>	

LESSON Plan

 Teacher	Name : Nae Natapei Subject : Basic Science
 Date	
	Topic : The Human Body -Nutrition Lesson number : 4 – Malnutrition and Deficiency Diseases
 Learning outcomes	<ul style="list-style-type: none"> • Explain what malnutrition is. • Describe the consequences and name deficiency diseases resulting from lack of certain nutrients in diets. • Explain why animal protein or mixed vegetables protein is essential for a balanced diet.
 Introduction	Not eating the right amounts of the right kinds of food will result in an unhealthy condition called malnutrition . Diets lacking essential food groups, vitamins and minerals will also result in different diseases. These diseases are called deficiency diseases .
	Catch phrase for the lesson
	<u>Summary</u>

MALNUTRITION

Malnutrition is the unhealthy condition or disease which results from not eating the right amounts of the right kinds of foods. Malnutrition can be a result of eating too much food, too little food, the wrong types of food or the wrong amounts of the different food groups.

Some diets may be deficient in (or lacking) an essential food group, vitamin or mineral. Below are some of consequences of a diet which is deficient in a particular group.

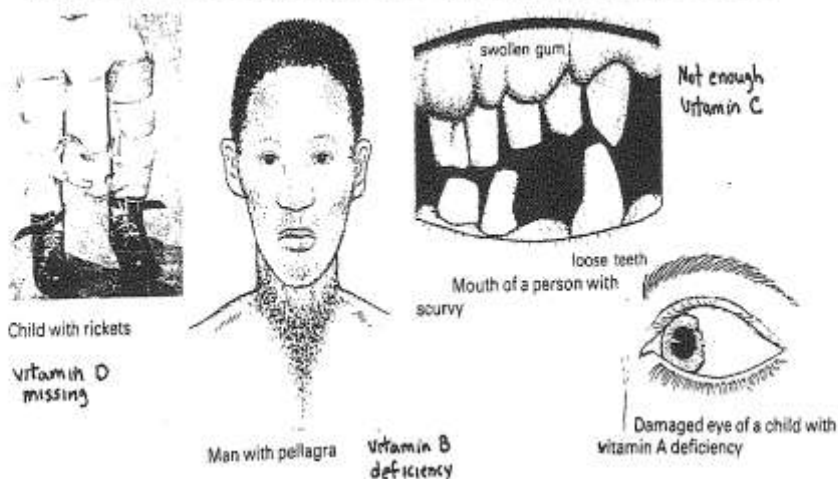
Practical Exercise 19: Deficiency Diseases

As you read through the following information try and fill in the missing items regarding the source & need for body building & energy foods in your notes.

1. Deficient Food: Protein (body-building food)
Sources:
Needed for:
Deficiency disease: Kwashiorkor - name given to protein deficiency in growing children. They have poor growth & restricted mental development. They are weak & miserable.
2. Deficient Food: Carbohydrate (energy food)
Source:
Needed for:
Deficiency disease: Lack of energy leads to starvation, inadequate growth & weight loss. People will be tired & have little energy to work.
3. Deficient Food: Vitamin A
Sources: milk, butter, green vegetables, liver, fish.
Needed for: Proper resistance against disease.
Deficiency disease: skin becomes dry & scaly, night-blindness.
4. Deficient Food: Vitamin B (1+2)
Sources: liver, egg, cereal, wholemeal bread, milk, meat, cheese, green vegetables.
Needed for: general health.
Deficiency disease: Beri-beri - loss of appetite & weight, swelling of the feet and legs. Pellagra - loss of weight, skin disease, mental disorders.

5. Deficient Food: Vitamin C
Source: green vegetables, pineapples, tomatoes, citrus fruits (lemon, orange, pample mousse).
Needed for: healthy skin, mouth & gums, resistance to disease.
Deficiency disease: Scurvy - wounds do not heal easily, skin cracks, mouth & gums bleed, joints become stiff.
6. Deficient food: Vitamin D
Sources: milk, fish, sunlight.
Needed for: allows the bones to form properly.
Deficiency disease: Rickets - soft or bent bones due to lack of Calcium absorption.

Figure 28. People suffering from vitamin deficiency disease.



Vanuatu has some common nutritional problems. In the rural areas, there is often a lack of protein. In the towns there is too much junk food eaten (high sugar & fat content but low vitamin & fibre content). There is often also not enough protein or protective food in towns.

Some foods are bad for you if you eat too much of them. So it makes sense to eat healthy foods & avoid those which can damage your health.

- * a little fat gives you a lot of energy. So it is easy to eat more than you need. Too many fats make you fat & can cause heart disease.
- * Sugar gives you energy but nothing else. It rots your teeth & also makes you fat. Cakes, chocolate & ice cream also contain hidden fat.

During processing in factories food loses dietary fibre & other goodness. Salt, sugar, colouring & other chemicals are added. These may do you harm.

To stay healthy we should eat:

- * foods which contain protein but not much fat like fish, chicken & nuts. They build you up without making you fat.
- * foods which give you carbohydrate, protein & fibre like potato, taro, wholemeal bread & brown rice. They fill you up without making you fat.
- * foods which contain dietary fibre, vitamins and minerals to keep you healthy. Foods like pineapples, oranges, tomatoes, bananas, cabbage, lettuce & pamplemousse.

Animal Protein & Vegetable Protein

In some places where it is hard to get fresh meat, fish, chicken or eggs (animal protein) to provide our bodies with protein, it is possible to get the bodies protein requirements from plants - this is usually called vegetable protein. If someone chooses not to eat meat they are called vegetarians.

All animals & plants contain proteins & therefore amino acids (you will learn more about these later). We need them to make our own proteins. Animal proteins contain all the amino acids needed to make human proteins but plant proteins usually only contain some of the amino acids needed.

People who rely on plants to provide their protein requirements must make sure that they eat a mixture of plant foods so that they obtain all the amino acids (from different plants) needed to make human proteins.



Visual aids






Exercises

Study the notes above and do the following activity, answering the questions.








1. Explain what malnutrition is.
2. Using information from your notes, complete the table below.

Food Nutrient	What it is needed for	Deficiency disease
Protein		
Carbohydrate		
Vitamin A		
Vitamin B (1+2)		
Vitamin C		
Vitamin D		
Iron		

3. Write down 2 differences between animal and plant protein.
4. Why is it important for people who rely on plant proteins to eat a mixture of plant foods?

 Assignment	
 Assessment	This topic will be assessed in the topic test
 References	

LESSON Plan

 Teacher	Name : Nae Natapei Subject : Basic Science
 Date	
 	Topic : The Human Body- Nutrition Lesson Number : 5 – What happens to food in the body
 Learning outcomes	Explain what happens, in the body, to the protein, fat and carbohydrate that they eat.
 Introduction	Each food group, once in our body, is digested (broken down) by the body into very small molecules. These tiny molecules are absorbed into the blood and are taken into our body cells to be used by the body. If you take in more than your body needs then the excess molecules, which are not used by the body are stored by the body to be used later.
 	Catch phrase for the lesson
 	<u>Summary</u>

Learners notes

What happens to food in the body

What happens to each of the three food groups that we take into our body? Each of them is digested in the digestive system into small molecules. This will be discussed in the next section in more detail. These small molecules can be used by the body or stored if we have eaten an excess. We shall look at each food group in turn.

(1) Carbohydrates (sugars & starch)

Almost all carbohydrates are broken down into a sugar called glucose. Glucose is carried in the blood stream to the cells where it is used in respiration to produce energy.

- some excess glucose is changed into a large molecule called glycogen & is stored in the liver
- remaining excess glucose is changed into fat & stored fat deposits. This is shown in Fig. 29 a

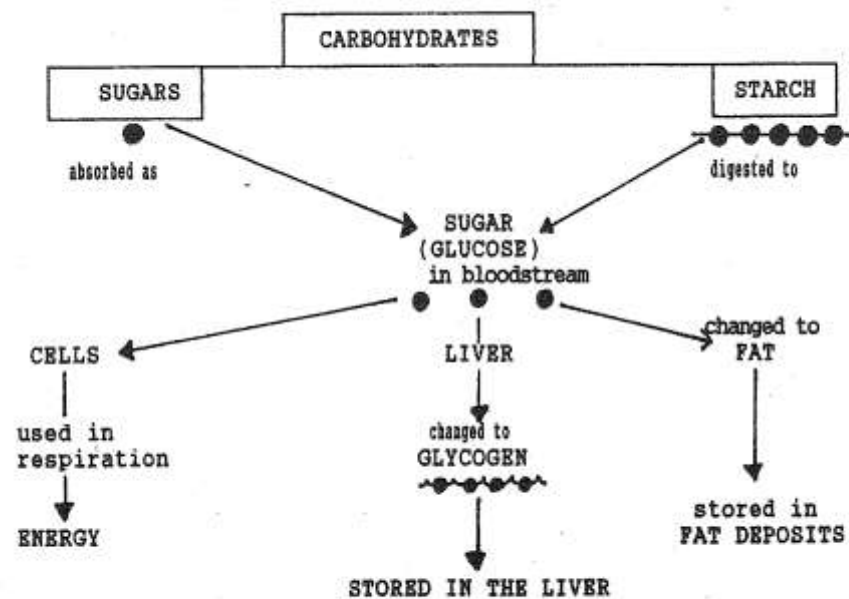
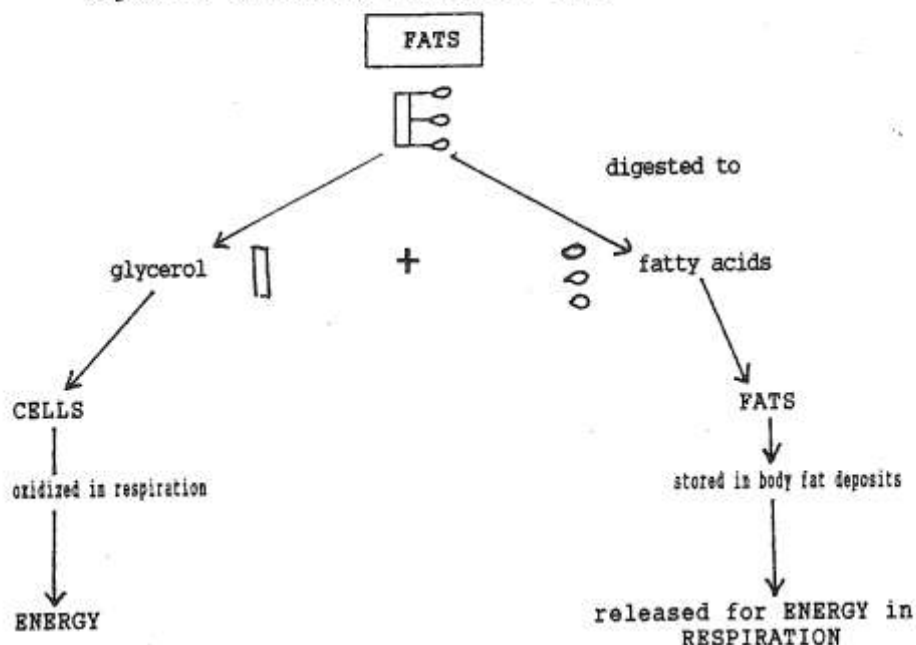


Figure 29a: Use and storage carbohydrates

(2) Fats

Fats are broken down to glycerol & fatty acids. These are either used in respiration to produce energy (fats give twice as much energy as carbohydrates) or are stored. Excess fat is stored as body fat in fat deposits. (It can be released to make energy in respiration if it is needed.)

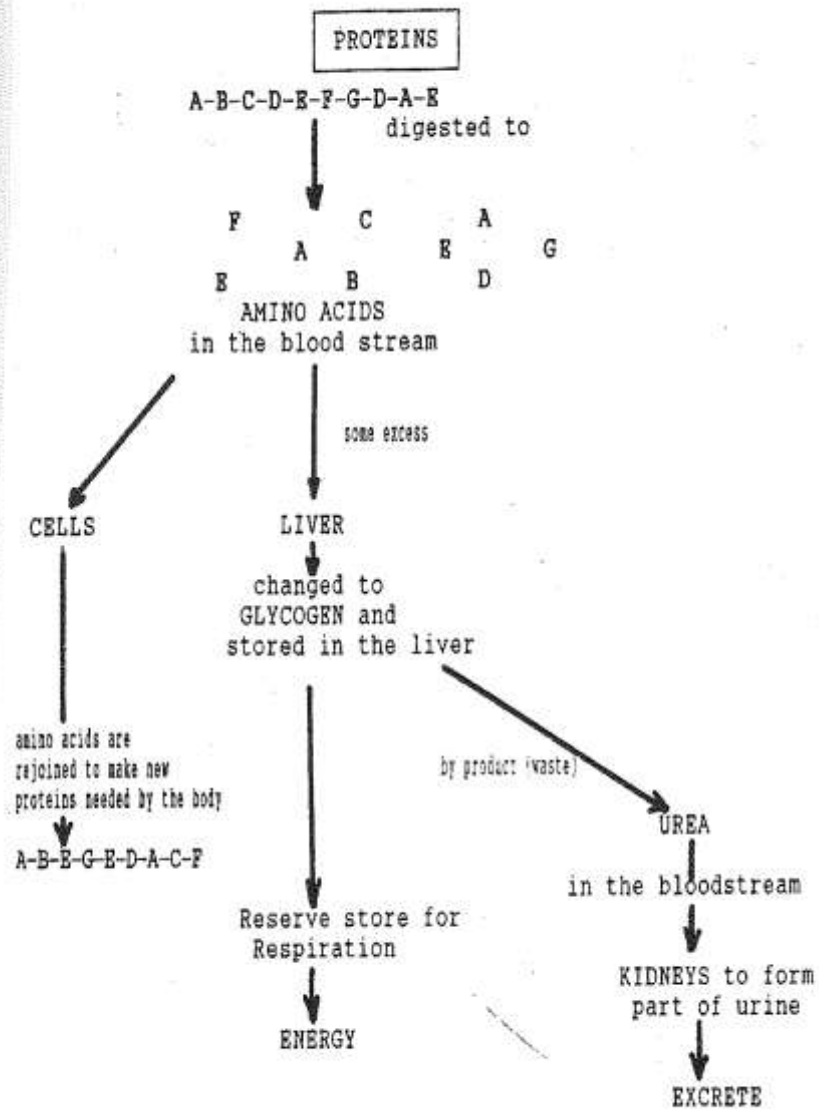
Figure 29 b: Use and storage of fats



(3) Proteins

Proteins are broken down into smaller molecules called amino acids which are carried in the blood stream. Some amino acids are used in the cells to make new proteins needed by the body. Excess amino acids (those not used right away) are not stored but are changed in the liver to glycogen. The glycogen is stored in the liver where it can be released to produce energy during respiration if needed. A waste product of the breakdown of amino acids to glycogen is urea. The urea which is made in the liver travels in the blood stream to the kidneys where it forms part of the urine which is excreted from the body.

Figure 29 c. Use and storage of proteins



Visual aids



Study the notes above and fill in the blank spaces below, with the correct words to make the statements true.

1. Carbohydrate (Sugars and starch)

Almost all carbohydrates are broken down by the body into simple sugars called _____. This simple sugar is carried in the _____ to the cells to be used in _____ to give you the _____ that you need.

If you take in more carbohydrates than your body needs then your body produces more glucose than the body needs. This extra glucose is called excess glucose and;

1. Some of it is changed into _____ and stored in the _____.
2. Some of it is changed into _____ and stored as fat deposits.

2. Fats

Fats are broken down by the digestive system into _____ and _____. This fat is transported to the _____ to be used for respiration to give the body _____.

Excess fat, which is not needed by the body, is stored as body fat in fat deposits and then released to make _____ when it is needed.

3. Proteins

Proteins are digested by the body into smaller molecules called _____. Some amino acids are transported in the blood to be rejoined to make new _____ needed by the body.

Excess amino acids, are carried by the blood to the _____ to be changed to _____. This _____ is stored in the liver, until it is needed by the body to be used in _____ to produce the body with the energy that it needs.

During this break down of amino acids, to form glycogen, a waste product called _____ is formed. This urea, which is made in the _____ is then carried in the blood to the _____ to form part of the urine that you excrete when you go to the toilet.



Assignment










Assessment

This topic will be assessed in the topic test.



References

LESSON Plan

 Teacher	Name : Nae Natapei Subject : Basic Science
 Date	
 	Topic : Human Body – Nutrition Lesson Number : 6 – Special Nutritional Needs.
 Learning outcomes	List the special nutritional requirements of babies, young children, adolescents, sick people, pregnant and lactating mothers.
 Introduction	We know that a balanced diet provides the right amounts of the right kinds of foods needed to keep the body healthy. A balanced diet for one person, is not necessarily a good diet for someone else, because some people have special nutritional needs.
 	Catch phrase for the lesson
 Learners notes	<u>Summary</u>

5. SPECIAL NUTRITIONAL NEEDS

At the beginning of this section, you read about what was a balanced diet. It was a diet which provided the right amounts of the right kinds of foods needed to keep your body healthy. A balanced diet for one person is not necessarily a good diet for someone else.

Some people have special nutritional needs:

(1) Pregnant Women: must provide protein & minerals for their developing baby.



(2) Lactating Women: A mother breast feeding her baby must make milk for it. She will need more protein & energy rich food.



(3) Sick People: Illness puts extra stress on the body. Extra protein is needed for replacement of damaged tissue.



(4) Babies, Young Children & Adolescents: When babies & children are growing the amount of protein in their diet should be high. Growing children also need extra minerals such as calcium & phosphorus, for making teeth & bones, & iron for making red blood cells. Energy rich foods (carbohydrates; fats & proteins) are needed to be used up in respiration to give energy for work & play.

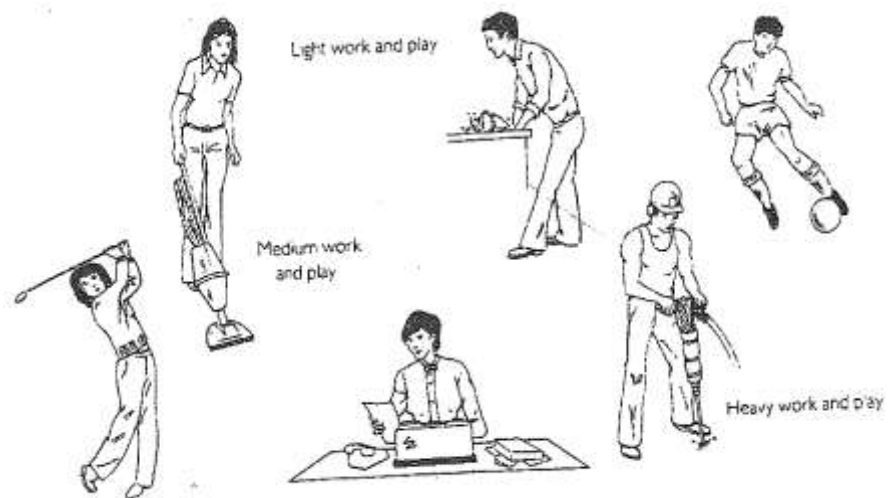


Visual aids

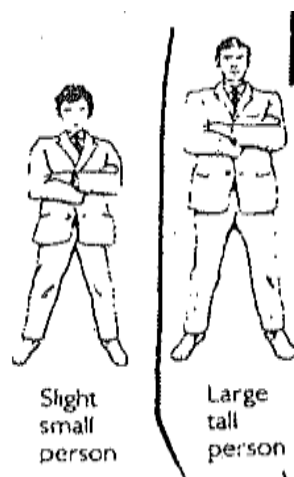


Exercises

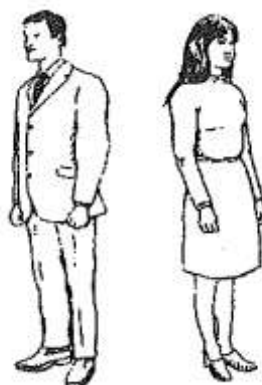
Using the pictures below, list down the 4 things that determine what a balanced diet is, for a person.



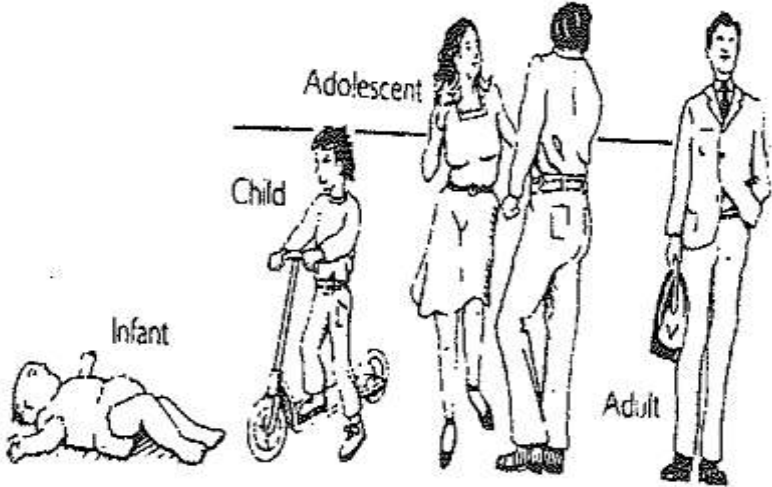



1. _____










2. _____



3. _____

	 <p>4. _____</p>
 <p>Assignment</p>	
 <p>Assessment</p>	<p>Will be tested in the topic test.</p>
 <p>References</p>	

LESSON Plan

 Teacher	Name : Nae Natapei Subject : Basic Science
 Date	
	Topic : Human Body- Nutrition and Digestion Lesson Number : 7- Nutrition
 Learning outcomes	<ul style="list-style-type: none"> • List advantages of breast feeding. • List the disadvantages of breastfeeding. • Explain the reason for supplementing human milk after 6 months. • List additional foods required by babies at 6 months. • Interpret and explain a babies growth chart.
 Introduction	One group that has special nutritional needs are babies and it is very important that these nutritional needs are met. Because babies are vulnerable to disease and poor health, mothers are encouraged to feed their babies with breast milk and not processed milk. Breast milk must then be supplemented with semi solid food when the baby is around 6 months old. The babies growth is monitored by weighing them often, and using a growth chart, the mother is able to tell if the baby is healthy and is growing well.
	Catch phrase for the lesson
	<u>Summary</u>

Breast Feeding

A mother's breast milk contains everything that a baby needs during the first four months of life. Breast milk is the best food for a baby because:

1. it contains antibodies which help to fight sickness
2. it is always clean (hygienic)
3. it has all the things a baby needs to make it grow & develop well (correct composition)
4. it is at the right temperature
5. it is always ready & you don't have to work to make it
6. it is cheap
7. it strengthens the child-mother bond
8. it is one of Vanuatu's customs

There are many disadvantages to bottle feeding a baby:

1. it doesn't have antibodies to fight disease
2. it can give sicknesses to the baby because it is not clean (eg. diarrhoea or vomiting) because the mother is not careful.
3. the baby won't grow & develop well if the milk is not made up correctly
4. it is a lot of work for the mother (boiling water, bottle & test, heating milk) every time the baby is hungry
5. it is very expensive

After about 4 months it is necessary to supplement human milk. There is no iron present in breast milk. The iron is needed by the baby for making haemoglobin. Some is stored in the body of the baby during its development but after 4 months it is all used up. The baby then needs additional foods rich in iron (eg: island cabbage, eggs, liver, vegetables, meat & cereals).

Babies also start to require additional foods rich in protein, calcium & phosphorus, needed for growth & making bones & teeth. The foods include green vegetables, milk, cheese, meat, eggs, fish & peanuts.

Growth of Babies

To know whether a baby is healthy & growing well it is important to weigh the baby often. The babies weight & continued growth can be recorded on a Weight Card or Growth Chart that is given at the clinic. Examine the weight chart on the next page. Two lines are marked on the chart. If a babies weight at a certain age is between those two lines in the shaded section, & the babies weight is increasing, then the baby is growing well. If the babies weight remains the same or decreases, the baby is not growing well. This could be for two reasons (1) The baby may be sick & must be taken to a clinic quickly (2) The mother may not be feeding the baby correctly & needs to find out from a clinic what to feed the baby.

The Weight Chart must be filled in regularly. During its first three years, the baby must be weighed every month, to make sure it is growing well. During its 4th, 5th year, the child should be weighed every 3 months.

Reasons for special case

Raisons justifiant une surveillance particulière

- ☐ Birthweight less than 2.5 kg / Poids à la naissance inférieur à 2,5 kg
- ☐ Fourth child or more / Quatrième enfant ou plus
- ☐ Environmental Problems / Problèmes d'environnement
- ☐ Birth less than 2 years from last birth / Espacement rapproché des naissances (moins de 2 ans)
- ☐ Multiple pregnancy / Grossesses multiples
- ☐ One or more children died / Un ou plusieurs décès d'enfants
- ☐ Single parent / Parent célibataire
- ☐ Pregnancy complications / Complications durant la grossesse
- ☐ Neonatal problems / Problèmes néonataux
- ☐ Congenital anomalies / Anomalies congénitales
- ☐ Not breastfed / Pas d'allaitement maternel

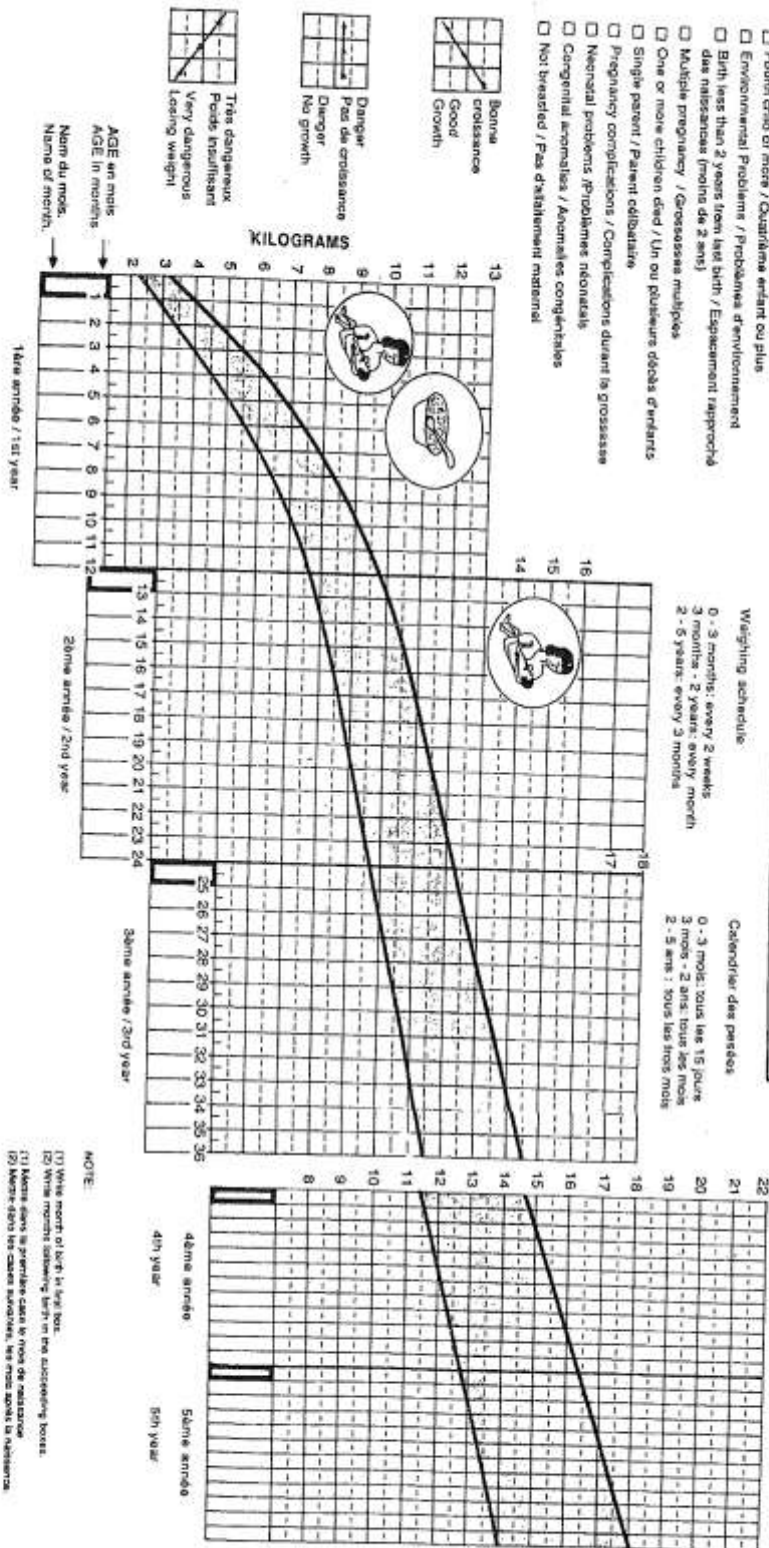
Weight Chart - Courbe de poids

Weighing schedule

0 - 3 months: every 2 weeks
3 months - 2 years: every month
2 - 5 years: every 3 months



Calendar des pesées

0 - 3 mois: tous les 15 jours
3 mois - 2 ans: tous les mois
2 - 5 ans: tous les trois mois



NOTE:

- (1) White month of birth is left box.
- (2) White month following birth in the succeeding boxes.
- (3) Marks given in previous cards in order of succession.
- (4) Marks given in cases indicated, the first given is reference.

 <p>Visual aids</p>											
 <p>Exercises</p>	<p>Study the notes on pages 48 and 49, then do the following activities.</p> <p>1. Complete the table below, by filling in the advantages of breastfeeding and the corresponding disadvantage of bottlefeeding</p> <table border="1"> <thead> <tr> <th>Advantages of breast feeding</th> <th>Disadvantages of bottle feeding</th> </tr> </thead> <tbody> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </tbody> </table> <p>2. Explain why it is important to supplement human breast milk when the baby is 6 months old?</p> <p>3. Explain why the baby must be given foods rich in calcium phosphorus and protein, at 6 months?</p> <p>4. Why is it important to weigh the baby often?</p> <p>5. Do practical 21 on the next page, and answer the questions that follow.</p>	Advantages of breast feeding	Disadvantages of bottle feeding								
Advantages of breast feeding	Disadvantages of bottle feeding										

Practical 21: Baby Growth Chart.

On a copy of a Growth Chart plot the weights of baby Charles.

Age	Weight (kg)	Age	Weight
0 Months	3	9	$7\frac{1}{2}$
1	$3\frac{1}{2}$	10	8
2	$4\frac{1}{2}$	11	$8\frac{1}{2}$
3	$5\frac{1}{2}$	12	9
4	6	13	10
5	$7\frac{1}{2}$	14	10
6	$7\frac{1}{2}$	15	$10\frac{1}{2}$
7	7	16	11
8	$6\frac{1}{2}$	17	$11\frac{1}{2}$

Questions

1. From his Weight Chart can you find a time when Charles was very sick?
2. Why did you think he was sick during this time?
3. What should his mother have done with Charles?
4. What could have caused the problem with Charles' growth?



Assignment










Assessment



This topic will be tested in your topic test.






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LESSON Plan

 Teacher	Name : Nae Natapei Subject : Basic Science
 Date	
	Topic : Human Body- Nutrition Lesson Number : 8- Review of topic
 Learning outcomes	Reviewed the topic Nutrition
 Introduction	Now you have learned everything that you need to, for the topic Nutrition. This lesson is for you to briefly review the topic.
	Catch phrase for the lesson
	<u>Summary</u>

<p>Learners notes</p>	
 Visual aids	
 Exercises	<p>Co through all the notes on for the topic nutrition and do the following review questions.</p> <p><u>Review Questions</u></p> <ol style="list-style-type: none"> 1. Name three foods rich in: a) dietary fibre b) protein c) starch. 2. Name foods needed: a) for strong bones & teeth b) to avoid scurvy c) for growth d) to avoid constipation. 3. Why does the body need a) carbohydrate b) protein c) vitamins? 4. Name the five types of food which make up a balanced diet. 5. What happens if you eat more than you need? 6. Why does a teenager need more food than a baby? 7. Explain why you should: a) eat less cakes, biscuits & ice cream; b) eat fresh food instead of processed food; c) cut most of the fat from meat, d) eat more fruit & vegetables. 8. How could you show that milk contained protein? 9. Grinding cheese in ethanol gives a filtrate which turns water cloudy. What does this tell you about cheese? 10. If a friend of yours was suffering from Beri-beri, what would you suggest-he should eat? 11. What deficiency disease might a person get if their diet was lacking Vitamin D? 12. Explain what happens to proteins when they are broken down in the body. 13. What type of foods should a mother who is breast-feeding her baby eat more of? 14. A friend of yours has just had a baby & has told you that she intends to bottle-feed the baby. What reasons would you give her to try to make her change her mind & breast feed the baby instead.

 Assignment	
 Assessment	
 References	

LESSON Plan

 Teacher	Name : Nae Natapei Subject : Basic Science
 Date	
 	Topic : Human Body- Digestion Lesson Number : 9- Principles of Digestion
 Learning outcomes	<ul style="list-style-type: none"> • Define digestion • Differentiate between mechanical and chemical digestion. • Differentiate between the number, and functions of the 4 different types of teeth in the human mouth. • Label the cross section of a tooth. • Differentiate between milk and permanent teeth.
 Introduction	The food that you eat must be changed into liquid to make it easier for it to be absorbed by the blood. Therefore the solid food that you eat must first be broken down into smaller pieces, and this takes place in the mouth, where the crushing, grinding of the food, by the teeth, breaks this food into smaller pieces.
 	Catch phrase for the lesson
 	<u>Summary</u>

4. PRINCIPLES OF DIGESTION

Your body needs food to stay alive. The rice, & fish & kumala all the other things you eat must be changed into a liquid inside your body, before your body can use them. The breaking down of food into a liquid occurs during digestion. Digestion is the process of converting large insoluble substances (in food) into small soluble molecules. The dissolved food can then be absorbed into the blood & carried around the body to where it is needed.

Food is broken down in two ways:

(1) Mechanically - large pieces of food are broken down into small lumps by the crushing & grinding action of the teeth & also by the churning or mixing action of your stomach.

(2) Chemically - by proteins called enzymes (these will be discussed later). Enzymes turn large insoluble food particles (starches, fats, proteins) into smaller soluble particles (sugars, amino acids, fatty acids).

MECHANICAL DIGESTION

Digestion starts when food is taken into the mouth. This is called ingestion. The teeth are used to break the food into small pieces. The pieces are mixed with a liquid called saliva & swallowed.

Teeth

You can't swallow an apple whole! To eat the apple, you first have to bite off a piece of it. Then you have to chew the piece until it has been ground down enough for easy swallowing. Different teeth have different jobs - some bite, others tear & others grind. An adult has a set of 32 teeth in his mouth. Each jaw has 16 teeth in it (see Figure 30).

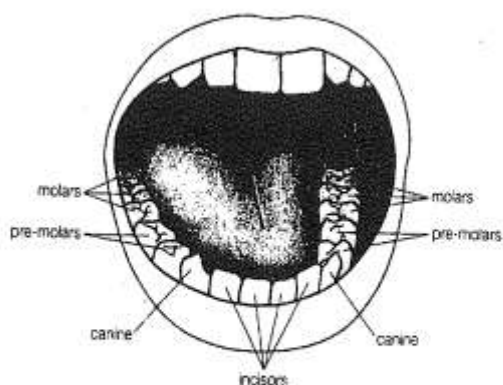


Figure 30: An adult set of teeth

There are 4 basic types of teeth which are shown in Figure 31.

- (1) Incisors - there are 8 of these teeth in the adult mouth, 4 in each jaw. Incisors have sharp edges & are used for cutting or biting food.
- (2) Canines - there are 4 of these teeth in the adult mouth, 2 in each jaw. Canines are long & pointed & are used for gripping & tearing food.
- (3) Premolars - there are 8 premolars in an adult's mouth, 4 in each jaw. These teeth are wider & flatter than incisors or canines and have ridges on them. They are used to chew & grind our food.
- (4) Molars - adults have 12 molar teeth in their mouths, 6 in each jaw. Like premolars, molar teeth are wide, flat & ridged & are used for crushing & grinding food.

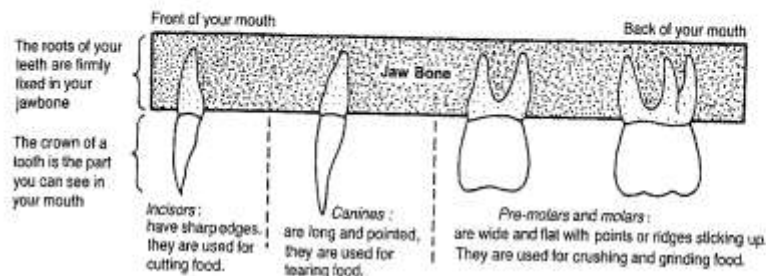


Figure 31: Four types of teeth

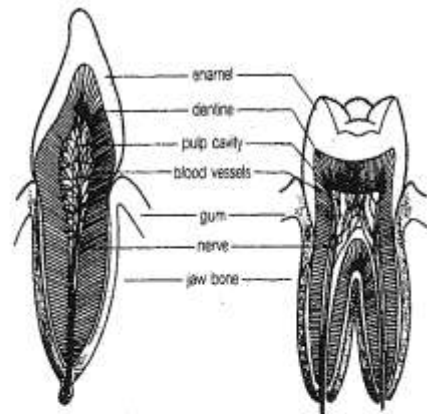
The arrangement of the teeth is the same on the upper & lower jaw. One each side of one jaw there are:

2 incisor	1 canine
2 premolar	3 molars.

Human grow two sets of teeth during their lives. The first set are called milk teeth. Milk teeth appear in babies when they are about 5 months old. Between the ages of 5 & 17 years your milk teeth are replaced by permanent teeth. These teeth should last you all your life. "Wisdom" teeth are the last molars of the permanent teeth to grow.

The part of the tooth which you can see is covered by a layer of white enamel. This is a very hard, non-living substance. It has a lot of calcium in it & makes a good biting surface. It also protects the tooth & prevents it from being worn away. The enamel covers a living part of the tooth which is made of dentine. Dentine is softer than enamel & is a bit like bone. It forms the main part of a tooth. In the centre of each tooth is the pulp cavity. This is made of soft pulp, which is made up of living cells. It contains nerves & blood vessels which keep the tooth alive & make it grow. All teeth are firmly fixed in the jaw bone of your jaw. Figure 32 is of a section through an incisor & a molar tooth showing all the different parts of the tooth.

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An incisor—biting tooth

A molar—a grinding tooth

Figure 32: Section through an incisor and molar tooth

Practical Exercise 21: Teeth in your jaw

Count how many incisors, canines, molars & premolars you have in each jaw. Ask a friend to help if you have trouble counting. Complete the following table using your findings.

Type of tooth	Number in each jaw	Function
incisors		
canines		
premolars		
molars		

Questions:

1. What is the total number of teeth in your mouth?
2. How many teeth are there in an adult's jaw?
3. How many more teeth have to grow in your mouth?
4. What is the name given to these teeth?



Visual aids



Exercises

Read notes on previous pages and complete the table and paragraphs.

Digestion is _____

Food is broken down in 2 ways:




1. _____
2. _____

Type of tooth	Number of teeth	Description and function
Incisor	8 teeth (4 in each jaw)	
		Long and pointed and are used for gripping and tearing food
		Wider and flatter than incisors and canines. Have ridges on them. Used for chewing and grinding of food
Molars		

Humans grow 2 sets of teeth during their lives. The first set is called _____. Between the age of 5 & 17 years. This first set of teeth is replaced by the next set called _____.

The white _____ is a hard non-living substance that covers part of the teeth which you can see. It covers part of the teeth which is made of _____, which is softer than the enamel.

At the center of each tooth is the _____ which is made of living cells. It contains _____ and _____ which keeps the tooth alive, and make it grow.

 Assignment	
 Assessment	This topic will be assessed in your topic test.
 References	



WEEKLY CHECKLIST For Parents:

Term: 2 Week number 1 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				

	3				
	4				
	5				
	6				

Term: 2 Week number 2 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 3 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 4 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 5 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 6 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 7 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 8 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 9 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 10 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 11 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 12 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				

	6				
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Term: 2 Week number 13 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

