

# NEW START Health for Secondary Students



## Student activity sheets

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# NEW START

## Introduction

Welcome to the NEW START health and nutrition program for secondary students.

Let's revise our acronym for good health:

**N** for Nutrients

**E** for Exercise

**W** for Water

**S** for Sunlight

**T** for Toxin minimization

**A** for Air

**R** for Rest

**T** for Think happy thoughts and also for Trust in God

**Activity:**

1. Look at the **New Start** Power Point presentation.
2. Look at the symbols on the diagram below and say what each one stands for.



# Unit 1: Getting the right nutrient balance

## 1A. What are nutrients

What are 'nutrients'?

Nutrients are the elements of **food** used by a living thing for growth, repair and the normal functioning of the living organism.

Let's think about this.

Does this mean that all foods contain nutrients?

You already might be thinking of some 'foods' available that do *not* contribute to the body's growth, repair and normal functioning.

Yes, you might have thought of sweets, cola drinks and other junk foods.

So that means that we don't classify junk foods as nutrients.

Now think of some of your favourite foods that *are* nutrients. Make a list.

You will be learning much more about nutrients in the next unit.

## 1B. The History of Food

The history of food began in the Garden of Eden. As the Bible tells us in Genesis chapter 1, God created plants on the third day. On the fourth day He created the sun to give light and warmth for the plants to grow. The plants were watered by a large moist canopy which gave dew. The temperature was perfect for plant growth. There were no droughts and no temperature extremes.

On day six God created two human beings who would be friends with God, who would walk and talk with Him in the Garden. He told them that they must eat plants and seeds only. There was no killing and therefore no meat, since the creation was perfect.

### Activity

List some of the foods you think Adam and Eve would have eaten. They did have fire and heat, so it is possible that they cooked some of their foods.

## **The History of Food (continued)**

It wasn't long before Adam and Eve disobeyed God, and God's creation was no longer perfect. The plants would now not always have ideal growing conditions. The first animal was killed to provide clothing for Adam and Eve. From this point on, animals were killed for food.

The human race indulged in all kinds of evil. God was sorry to see His original perfect creation corrupted. He decided to send a Great Flood as judgment upon the sin in the world. He chose a man named Noah to be His servant. Noah followed God's instructions and built a boat called an ark so that his family could be saved from the flood. When the boat was finished God sent two of each kind of animal to Noah. God also sent seven of some animals - like sheep, goats and cattle - because these were going to be the food supply for Noah and his family when they came off the ark; for a while there would be no plants as they would have been destroyed by the flood.

It was at this time that God gave permission to eat meat, but not just any meat. God gave special instructions about the kind of meat to eat. God chose animals that were safe to eat. He did not choose animals that ate other animals, e.g. cats, dogs, vultures and shellfish. He did not choose animals that ate dead meat. These animals carried diseases. You can read God's instructions to His people in Leviticus 11: 1-23.

## **Questions**

1. Which animals from Leviticus 11 had split hooves and chewed their cud?
2. What does it mean to "chew the cud"?
3. Which animals do we eat today that have split hooves and chew their cud?
4. Name some animals that are scavengers.
5. What could be wrong with humans eating scavengers?
6. Do shellfish have fins and scales? Why is eating shellfish sometimes risky?
7. Which birds did God tell us not to eat?
8. Why do you think it is better to eat a chicken rather than an eagle or vulture?

## The History of Food (continued)

As time went on people learned the necessary skills for farming crops and animals. Farmers in early times used the *fallow system*. This meant that that field would have a rest from growing crops for a season. The field would be ploughed and left unplanted, giving the soil a chance to recuperate after the previous crop. This resulted in an improved harvest the next season.

The Industrial Revolution in 18<sup>th</sup> century Europe saw the introduction of machines. Grains that were once harvested and ground by hand could now be processed many times faster by machinery. At this time crop rotation was introduced. Farmers rotated their crops so as not to exhaust the soil of its nutrients.

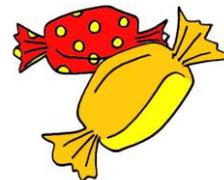
Up until the 20<sup>th</sup> century plant food crops were very nutritious because the soils were full of nutrients. Farmers fertilized their crops with compost and animal manure. Animal foods were also nutritious because animals ate the nutritious plants. The food chain was free of chemicals and pesticides.

In the 20th century, World War 2 instigated the development of chemicals for warfare. Thousands of chemicals were introduced into the environment just after World War 2. These gradually found their way into our food chain in the form of artificial fertilizers and pesticides. Some pesticides like DDT were highly toxic and stayed in the soil.

Today, unless grown organically, farmers rely on chemical fertilizers, pesticide and herbicides when growing food. While artificial fertilizers provide enough nutrients to make the plants grow large enough, they do not provide nearly as many nutrients as the old-fashioned natural fertilizers, compost and manure.

Today manufacturing companies add chemicals to many processed foods. These are in the form of preservatives, flavor enhancers and colorings.

Manufacturing companies today also add extra fats, sugar and salt to processed foods to make them tastier. Processed breakfast cereals contain over a hundred times the level of salt compared to rolled oats. Some are very high in sugar. This includes snack bars like muesli bars that pretend to be healthy. The sugar is labeled as “glucose” which sounds healthy, but it’s really just sugar. All these added ingredients can contribute to obesity, heart attacks, stroke, diabetes, cancer, and in younger people, ADHD (attention deficit hyperactivity disorder).





## 1C. Good fats bad fats

People in early Bible times were fishermen, hunters and gatherers. The food was not polluted. The animals were healthy and did not have to be given antibiotics as animals do today to ward off diseases. The plants were not sprayed. People in those days ate a wide variety of healthy foods. There were no processed foods as we know them today.

People lived much longer and had boosted brain power. Their brain power was boosted by the consumption of omega-3 and omega-6 fatty acids. Omega-3 is found in fish, and some plant foods like walnuts and flaxseeds. Omega-6 is found in avocados, olives, other vegetables, nuts and seeds.

Omega-3 and omega-6 provide us with good fatty acids and are particularly good for brain cell activity. Omega-3 is especially important and is essential; however it is the one that most people lack. We need to keep omega-3 and omega-6 in balance because too much omega-6 blocks absorption of omega-3. We need omega-3 for protection of our heart and brain. An overbalance of omega-6 can take away that protection.

Fats are either *saturated* or *unsaturated*. Just because a fat is unsaturated doesn't mean that it's good, and just because a fat is saturated doesn't mean that it's bad. The best unsaturated fats come straight from the food source, like avocados. Olive oil, another unsaturated fat, is a good fat because it withstands high temperatures in cooking without changing to a bad fat.

The worst saturated fats are found in processed foods such as pastries, cakes and fried foods. These contain a bad form of omega-6. Cheap vegetable oils like canola oil, corn oil and margarine, used in most bakery goods and fast foods, have been heated to high temperatures in the manufacturing process. These oils are not good for us. These bad fats are called "trans fats". They can contribute to diseases like heart disease, obesity and cancer.

Saturated fat comes from animals and also from coconuts. Butter is an example of a good saturated fat. It helps us absorb the fat-soluble vitamins A, D, E and K. Coconut oil is also a good fat. It helps us burn all the fats we consume and provides protection for our cells.

How do we get energy? It is made in our cells. Our cells are like little engines that make the body function. Every cell needs good fats to function properly.

### **A note about fish:**

While fish is a good source of Omega-3, some fish today, particularly tinned tuna, is contaminated with heavy metals like mercury. These pollutants come from factory waste that finds its way into the ocean. Smaller fish, like sardines contain fewer contaminants than big fish like tuna.

## Questions

1. Which food contains omega-3 fatty acid?
2. Which foods contain omega-6 fatty acid?
3. Omega-3 and omega-6 are good for us if they are straight from the food source and not in the form of heated-processed oils. Why are they good for us?
4. Name two good sources of saturated fat.
5. List some sources of trans fats.
6. Why should we avoid trans fats?
7. Tick the sources of good fat from the following list:

- Coconut oil
- Butter
- Corn oil
- Canola oil
- Olive oil
- Almonds
- Cashews
- Avocadoes
- Sesame seeds
- Sunflower seeds
- Fish
- Margarine



Answers to no. 7 – How many did you get right?

Good fats are: coconut oil, butter, olive oil, almonds, cashews, avocadoes, sunflower seeds, fish

## 1E. Protein for strength

The first humans did not eat meat and yet they were very healthy. God told Adam and Eve to eat only plants. Animal foods and certain plant foods provide our bodies with protein. We cannot live for long without protein. Protein from food gets broken down by our bodies into **amino acids**. The body then uses amino acids to build muscles. Without protein we would be very weak! Another function of amino acids is the construction of the brain's neurotransmitters. These are chemical messengers that send signals to the brain, which then tells us what to do. Without enough protein the brain does not receive the right signals. We should therefore include some protein at every meal to keep our brains working well. However, if we take in too much protein in the form of red meat, some of the important amino acids can be blocked.

Here are some sources of protein:

**Animal sources:**

Meat, fish, eggs, dairy products

**Plant sources:**

Nuts, seeds, grains and legumes (*Note: legumes are peas, beans and lentils*)

### Activity

List some foods that Adam and Eve would have eaten for protein.

### Getting the right amount of protein

To remain healthy, it is important that we get the right amount of protein: not too much and not too little.

But too little protein means there are not enough building blocks for energy and growth. Our cells have little engines that keep our bodies functioning properly. When our cells are not healthy, we are not healthy. We may catch colds often and generally feel tired. To find out your daily protein needs for an adult, take 100 away from your height in cm.

*Example:*

Height (cm) – 100 = daily protein requirement in grams

For an adult 170 cm tall, they need 70 grams per day. But people need more protein when doing strenuous exercise. Children and teenagers would need at about 50 grams of protein per day, regardless of their height, because they are still growing.

### Which type of meat is best?

Animals that are free to move around are healthier, and give us better quality meat than animals that do not get exercise. Meat from active animals is called "free-range". This type of meat has good nutrient value. Some sheep and cattle are given grain to fatten them up. Sheep and cattle were made to eat fresh grass. Grain-fed meat is low in omega-3 oils and other nutrients. These animals are prone to disease and as a result may be treated with antibiotics.

The same goes for chickens that are raised in barns and never get to scratch around in a natural environment. Free-range chickens are much healthier than barn-raised chickens.

When buying meat, it's best to choose meat that is as close to the natural source as possible. Try to avoid processed meats like salami, frankfurters, sausages, ham and bacon. These contain food additives called nitrates - (food numbers 249, 250, 251, and 252). These chemicals may have a bad effect on our health. Another additive to avoid is MSG (monosodium glutamate). This is a flavor enhancer found in some take-away foods, including some Chinese food and some processed supermarket foods like savory snacks. Always read labels to make sure the food you buy does not contain MSG. If you buy Chinese food, ask whether MSG is used before you buy. Not all Chinese restaurants use it.

### **Milk – another source of protein**

Milk and other dairy products are a good source of protein. About 40 years ago milk came in bottles and always had cream on top. You had to shake the milk to mix the cream through. But someone came up with the idea of “homogenizing” milk. This meant that the fat was now broken up into tiny globules and dispersed throughout the milk and there was no need to shake up the milk. But here is a problem. These small fat globules can cause long-term damage to the arteries. Some researchers are now asking whether the homogenization of milk is contributing to the increased rate of heart disease in the Western World.

Natural yoghurt is a beneficial food because it is a good source of protein and aids digestion. It has beneficial bacteria, acidophilus and bifidus. This helps break down the normally indigestible part of milk. Most flavored yoghurts contain thickeners and are not naturally thickened by the action of the beneficial bacteria; they are therefore very low in the beneficial bacteria and not much better for us than ordinary milk. They also contain sugar which is not good for our immune system. If you find natural yoghurt too sour you can always sweeten it yourself with a little honey.



## **Plant protein sources**

Lentils, chick peas, red kidney beans, yellow split peas are all legumes. They are a much-forgotten source of protein in Western society. If we look at traditional cultures around the world we see that legumes are a staple. Indian, Mexican and Middle Eastern cultures eat legumes every day. These are a very healthy option and definitely worth trying. The traditional flavors of curry, chili, or tomato and garlic make these dishes delicious. Try some of the recipes from the *Recipe Section*.

*Other sources of plant protein:* nuts, seeds, and some grains

## **Complete and incomplete protein**

If a person is vegetarian and relying on plant-based protein alone, then there are some things they need to consider. A vegetarian must understand the difference between *complete* and *incomplete* protein.

Proteins are made up of amino acids. Think of amino acids as the building blocks. There are 20 essential different amino acids that join together to make all types of protein. Some of these amino acids can't be made by our bodies, so these are known as essential amino acids. It's essential that our diet provide these.

A complete protein source is one that provides all 20 essential amino acids. Animal-based foods, (meat, poultry, fish, eggs and dairy products) are considered complete protein sources.

**Animal products contain all 20 amino acids. Animal products provide *complete* protein. Plant foods do not contain all 20 essential amino acids. They provide *incomplete* protein.**

But by eating a large variety of vegetable protein foods, vegetarians can take in the full complement of amino acids. For example, both rice and dried beans contain different amino acids. But together, they may provide adequate amino acids. This does not mean that they need to be eaten at the same time. It just means that food intake for one day should contain a variety of plant protein foods.

<http://www.cdc.gov/nutrition/everyone/basics/protein.html>

## Activities:

1. Make a list of protein foods suitable for a vegetarian.
2. Name and describe a traditional dish from India, Mexico or the Middle East that uses legumes for one of the principal ingredients.
3. Choose some healthy proteins to include at each meal:  
**Breakfast; Lunch; Dinner:**  
Draw up a table to show this.
4. Why is it important to get enough protein?
5. Which is the best kind of meat to eat?
6. What are some of the problems associated with regular homogenized cow's milk?
7. What are some alternatives?
8. What are some benefits of natural yoghurt?
9. What is your recommended daily intake of protein?

<b>Recommended Daily Allowance of protein for teenagers:</b>
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Males 15-18 years old – 59 g.
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Females 15-18 years old – 45 g.
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10. Use the food analysis chart on the next page to make a table of protein foods that would give you your Recommended Daily Allowance. Set out the table showing breakfast, lunch, dinner and snacks. Include the measure and weight of each food.
11. Comment on whether you get enough protein on a typical day.

## Food analysis chart

Food	Measure	Weight (g)	Protein (g)	Carbs (g)	Fat (g)
Cheese, camembert	2.5 cm cube	17	3	0	4
Cottage cheese	Half cup	114	13	4	4
Yoghurt, plain whole milk	1 cup	245	9	11	8
Eggs, boiled	1	50	6	1	5
Butter	1 tblsp.	14	0	0	11
Olive oil	1 tblsp.	14	0	0	14
Avocado	Half cup	75	1.5	5.5	11.5
Banana	1 large	152	2	36	1
Grapes	1 cup	160	1	28	1
Kiwi fruit	1	76	1	11	0
Orange	1	151	1	17	0
Apple	1 large	212	0	32	1
Strawberries	1 cup	157	4	44	1
Bread, wholegrain	1 slice	26	3	12	1
Pasta- spaghetti	1 cup (cooked)	140	7	40	1
Beef steak (lean)	1 portion	85	24	0	17
Lamb	1 potion	85	21	0	18
Chicken (breast w/o skin)	1portion	85	7	1	0
Almonds	Half cup	71	15	14	36
Broccoli	Half cup	36	2	4	0
Carrots	Half cup	64	0.5	6.5	0
Tomato	1	62	1	3	0
Pumpkin	Half cup	122	1	6	0
Potato	1	143	4	27	9
Chick peas (cooked)	1 cup	240	12	54	1
Fish- salmon	1 piece (grilled)	85	22	0	4

## 1E. Carbohydrates

Carbohydrates are the starchy and sweet foods that provide fuel for energy. Here are some examples of foods that are high in carbohydrates:

vegetables, fruits, pasta, bread, flour, rice, sugar (or anything made from sugar)

When we exercise, our cells burn fuel to make more energy. The main fuel is the carbohydrate food group, (carbs for short). Carbs provide the energy that fuels muscle contractions. Once absorbed, carbs breakdown into smaller sugars and are used as *energy* for our brains and muscles. Any glucose not needed right away gets stored in the muscles and the liver. When these stores are filled up, any extra gets stored as fat.

It is important therefore not to get the carbs out of balance by having an overload. We need to have a balance of protein, carbs and vegetables at every meal. Too many carbs, especially if we are not doing enough exercise to burn them up, will mean that the extra carbs get stored as fat. On the other hand, we need to get enough carbs in the diet or we will feel tired.

### How do we get the right balance?

1. Follow the Healthy Food Pie as a guide to the *quantity* you need per day.
2. Choose good *quality* carbs to give you an even balance of energy throughout the day (no highs and lows), and to avoid putting on weight.

### What are good quality carbs?

Some carbs are refined. This means that they are usually white and processed. These are not good quality carbs. They will certainly give you that burst in energy that you are looking for when you are tired. They charge quickly into your bloodstream and get to work immediately. They give you high blood sugar. But very quickly they get burned up, and your body system is suddenly left with no energy at all. This is low blood sugar. Refined carbohydrates take you on a rollercoaster ride of highs and lows in energy throughout the day. They also store very well as fat. Examples of refined carbohydrates are foods made from white flour, white potato and cane sugar – foods such as white bread, cakes, pasta, biscuits, chips, crisps and sweets.

Complex carbohydrates on the other hand are good carbs. These are the unrefined foods like colored vegetables, brown rice, rolled oats, and legumes. Sweet potatoes are full of goodness, and less starchy than white potatoes. Legumes, (lentils, dried peas and beans), are a good combined source of complex carbohydrates and protein. Complex carbs take longer to break down and therefore give you sustained energy throughout the day. They do not readily go to the fat stores, but pass easily through the digestive system because of the adequate fiber they contain.

Juicy fruits are simple carbohydrates that break down quickly. They are high in vitamin and mineral content and good for a quick energy boost.

**Activities:**

1. What is the function of carbohydrates?
2. List some refined carbohydrates.
3. What are some of the disadvantages of refined carbohydrates?
4. List some complex carbohydrates.
5. What are some of the advantages of complex carbohydrates?
6. List some complex carbohydrates that could be eaten at the following meals:

Breakfast: \_\_\_\_\_

Lunch: \_\_\_\_\_

Dinner: \_\_\_\_\_

7. What happens when there is a carbohydrate overload without sufficient exercise?



## 1F. Vegetables and Fruit

Vegetables and fruits are God's medicine, but good tasting medicine. In *The Lion, the Witch and the Wardrobe* by C.S. Lewis, Aslan gave Lucy a little bottle of medicine that she used many times for the healing of others. We can think of fruits and vegetables as that bottle of medicine. They contain essential vitamins and minerals. In their raw form, plant chemicals present in fruit and vegetables will protect us from damage in our cells. These plant chemicals are called antioxidants. So it is good to include a good percentage of raw vegetables in our daily food intake.

Our bodies are constantly at war. Cell damage can occur when there are not enough vitamins and minerals to combat the negative effects of pollutants coming from the environment, from the waste products within our body system and from bacteria and viruses. Cell damage can occur gradually and can lead to diseases like cancer and heart disease later in life. Living plants contain antioxidants and enzymes that help us fight the viruses and diseases we come into contact with from day to day, and help us build a healthy immune system.

Fruits and vegetables are color coded. Different colors represent different nutrients. For example the green leafy vegetables are rich in magnesium, a mineral essential for healthy bones and muscle function. Red and orange vegetables are high in antioxidants. Eating a range of colors in fruits and vegetables is therefore important. Remember that legumes come into the vegetable category. They are dried peas and beans.

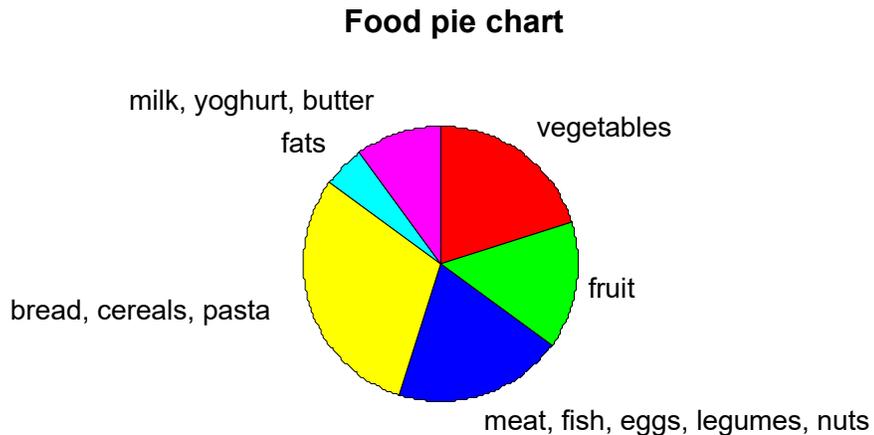
Another importance of fruits and vegetables is that they contain fibre. We need fibre for a healthy digestive system. The food transit time, from when we eat our food until the time it passes out, should be approximately 24 hours. Fibre helps the food to pass through the digestive system at a healthy rate and protects us from bowel cancer.

Fruits are an excellent source of vitamins, minerals and antioxidants, but we shouldn't eat as much fruit as we do vegetables. If we ate fruit all day we may get an overbalance of simple carbohydrates. Although the sugar in fruit is a healthy type of sugar, unlike cane sugar, it is still a carbohydrate. Fresh fruit is an excellent food to eat at breakfast because it helps the body eliminate waste as feces, and the morning is the time when the body is programmed to do this. Fruit can also be eaten as a between-meal snack. It's better eaten on an empty stomach because it does not digest very well following a heavy meal.



## Activities:

1. Look at the *Food Pie Chart* and estimate the percentage of colored vegetable intake to maintain optimal health. (Don't include white potatoes in this section).



2. Estimate the daily percentage of fruit intake.

3. Choose fruits or vegetables that you would like to include at the following meals:

Breakfast:

Lunch:

Dinner:

4. Find the dictionary meaning of 'antioxidants'.

5. What are the benefits of fruits and vegetables?

7. Why are raw vegetables important?

8. Why are green leafy vegetables important?

9. Use *The Food Analysis Chart* on p. 13 to design a meal planner for a day. Include the right balance of protein, carbohydrates, good fats, fruits and vegetables.

# TEST: Getting the right balance

## Answer T or F

1. In the Garden of Eden God told Adam and Eve to eat only plants.
2. Food crops fertilized with compost and manure contain more nutrients than those grown with chemical fertilizers.
3. Olive oil contains beneficial omega-3.
4. Margarine is a good fat.
5. Saturated fats are always bad fats.
6. Sugar and white flour are refined carbohydrates.
7. Brown rice and lentils are complex carbohydrates.
8. We should eat an equal amount of fruit and vegetables each day.
9. It is best to eat fruit immediately following a heavy meal.
10. Green leafy vegetables can help to build bones.

## Answer each question with a single word:

11. Trans fats are vegetable oils that have been heated to \_\_\_\_\_ temperatures. (high/low)
12. A good brain food is \_\_\_\_\_.
13. The best food group for muscle building is \_\_\_\_\_ . (carbohydrates, proteins, fats)
14. An example of a food that provides protein is \_\_\_\_\_.
15. An example of a food that provides carbohydrate is \_\_\_\_\_.
16. Carbohydrates provide our bodies with e \_\_\_\_\_.
17. Antioxidants in fruits and vegetables help fight d \_\_\_\_\_.

**Circle the best answer:**

18. Amino acids are:

- a) digestive enzymes
- b) the building blocks for proteins
- c) fatty acids

19. An adequate daily protein intake in gram is:

- a) Your weight in kilos plus 100
- b) Your height in meters minus 100
- c) Your height in cm. minus 100

20. Carbohydrates that exceed the body's energy requirements get stored:

- a) as fat
- b) as protein
- c) in the brain

**Score:**

## Unit 2: Digestion, diets and addictive foods

### 2A. Weight-loss diets

Many people want to lose weight. People are keen to try the latest diet because it sounds great and promises rapid transformation of your body into that of a movie star. While it is not important to look like a movie star, your body weight is important. Being overweight can expose people to risk of lifestyle diseases such as diabetes and heart disease.

With most people, trying to stick to “*a diet*” is not very successful. They soon revert to their old eating patterns. The only way to lose weight through food intake is to decide upon *a lifestyle change*, and stick to it. Healthy food, with a predominance of fresh vegetables, is the best way to get results.

Here are some popular diets. Not many of them are to be recommended.

#### 1. Low-carb diets

These diets restrict carbohydrate consumption. Foods like bread, pasta, cereals, sugar, fruit and potatoes are replaced with a greater proportion of high protein food like meat. Weight can be lost when the body burns fat for energy instead of carbohydrate. Because carbohydrate is extremely restricted, then the body must turn to burning fat for fuel. Many people lose weight on this diet. It can be a good kick-start to losing weight, but down the track it is advisable to lessen the extra high meat intake and include some good complex carbohydrates. Eliminating junk carbs, a key feature of this diet, is a good aspect.

#### 2. Low-fat diets

The very low-fat diets turn out to be very high carbohydrate diets. This diet consists of mainly grains, fruits and vegetables. Processed foods sold as “low-fat” are higher in carbs. For example, low-fat biscuits contain more sugar than the average biscuit. Once the fat has been taken away the biscuit is no longer tasty. So manufacturers add extra sugar to make up for the lost tastiness. A person cannot go without fat for very long. The dieter will very soon want some foods higher in fat or protein, so will lapse into eating junk food. A very low-fat diet is not healthy because we need our good fats: omega 3 and 6 fatty acids, found in fish and plants, and good quality animal fats like butter.

#### 3. Calorie restricting diets

People may choose to use a calorie table, calculating their calories for the day. If a person has eaten low calories all day, eating salads for example, they may treat themselves at the end of the day by eating a piece of cheese cake. They can eat whatever they want as long

as their daily calorie intake is under a certain number. (The average person requires 2000 calories per day. A low-calorie diet may restrict you to something like 1500.

#### **4. The Pre-measured diet**

There are companies that supply your food in pre-measured servings. This takes the decision-making out of the eating. It may be easy to follow but is expensive, and doesn't help the person learn how to prepare their own healthy food. Another type of pre-measured diet is the meal-replacement diet, where meals are replaced by a milk-shake type drink that supposed to contain all the nutrients you need but less carbs.

#### **5. The 5:2 diet**

This has been made popular by Michael Mosley and is having success among those who want to lose weight. The point of the 5:2 diet is that you give your body 2 'fast' days per week, (actually restricting food intake to 500 calories per day), and 5 days where you eat 3 normal healthy meals per day, (around 2000 calories per day). So on the fast days you are eating about a quarter of the calories you normally would. You can either have one healthy meal a day or three small healthy snacks, as long as your calorie intake doesn't exceed 500 calories on the fast days.

#### **6. The Sensible-eating diet**

This is not so much a diet but a lifestyle. It majors on fresh plant foods, as close to their natural form as possible. It includes natural meats, eggs, butter and other good fats, fresh vegetables, fruits, legumes and some nuts. It is colorful and delicious. Daily exercise must be included to burn calories. This way of eating eliminates white refined carbohydrates, junk food and sugar.

#### **7. Diet Pills**

These pills can be bought from the pharmacy. Most of these have no value. Many contain mixtures of so-called slimming ingredients. Some contain fat-blocking ingredients, which absorb only very small amounts of fat. They have the negative effect of preventing you from absorbing the fat-soluble vitamins A, D, E & K. Others are appetite suppressants made from fibrous gel which makes you feel full. However, some of these have been shown to cause internal blockages in some people.

#### **Dangers of dieting**

Crash diets do not usually help with weight loss. A crash diet is when someone makes a sudden decision to do all they can to lose weight quickly. They may skip meals and neglect the intake of important nutrients. They constantly think about food or lack of it, and tell themselves, "I'm on a diet!" A crash diet usually does not last for long, and the person suddenly finds themselves eating excessive amounts of junk food.

People who worry too much about looking overweight may develop eating disorders such as the following:

**Anorexia nervosa** - An eating disorder involving a psychological loss or denial of appetite and self-starvation, related in part to a distorted body image and to various social pressures commonly associated with puberty.

**Bulimia nervosa** - An eating disorder in which large quantities of food are eaten at one time (binge eating) and then purged from the body by vomiting, or misuse of laxatives, diuretics, or enemas. The word 'nervosa' refers to disgust with one's body weight.

If you are overweight, it is right to make a decision to lose weight to improve your level of fitness and health. However, this must be a sensible decision, with the aim of losing weight gradually by choosing to eat a good balance of healthy unrefined foods, accompanied by regular exercise.

### Activities:

1. Rank the diets in order from the one you think would be the most successful to the one you think would be of least benefit.
2. Write a report on the two diets that you think are the best and give your reasons why.
3. Now do the same for the two diets that you rate as the worst and give your reasons.
4. What is anorexia nervosa and what causes it?
5. Read Psalm 139 and explain why people should not put themselves down about the way they look.
6. What advice would you give to a person who is constantly worrying about being overweight?



## 2B. Comfort foods and addictive foods

So often we use food to comfort ourselves in response to emotions. We may feel down because of troubles with relationships, or worried by exams looming up, or maybe we just don't feel good about ourselves. Many people in these situations turn to food to distract them from their negative thoughts. They comfort themselves by eating their favourite foods. But unfortunately, many favorites are loaded with calories, fat and sugar. These foods are also eaten at the wrong times. They are eaten when the person is not necessarily hungry. People just eat to feel good. Eating in between meals, especially high calorie foods, can contribute to poor digestion and being overweight. Our digestive system needs time in between meals to rest, or food stays in the digestive tract for longer leading to toxicity. Here are some common comfort foods:

Pizza, ice-cream, chips or crisps, bread, pasta, sweets, chocolate, cookies, soft drinks

These types of foods can be addictive. Sometimes you start on one of the above and you just can't stop.

### **Addictive foods:**

Eating cane sugar and processed grains like white flour will cause a rapid rise in blood sugar. This makes us feel-good temporarily and we quickly become addicted to these foods and can't give them up. Being on a continual 'high' with sugar and white carbs stresses the body and depresses the immune system. It also depletes the body of essential vitamins and minerals. Not to mention dental decay! Another addictive food is salt. Manufacturers know that these foods are addictive and add sugar and salt to most processed foods.

The surprising thing is this: if you take a complete break from these foods, you find you don't crave them. Two things to aim for:

- Only eat when you are hungry
- Eat good healthy meals and don't eat in between. (If you *really* need to eat something for energy in between meals, try a piece of fruit or vegetables sticks)

### **Activities**

1. Make a list of your own comfort foods.
2. Why do people eat comfort foods?
3. What suggestions can you make to help someone who is feeling depressed and cannot stop eating comfort foods?
4. Write out these Bible verses: Matthew 11:28 and 1 Peter 5:7. How can these verses help someone who is feeling down?

### **Questionnaire: Are you a food addict?**

1. Which sort of food experience do you enjoy the most?
  - a) a big box of chocolates
  - b) a meal at a restaurant
  - c) a delicious home-cooked meal
  
2. What is your favourite type of food?
  - a) Chocolate, sweets, bread, cake, biscuits, desserts.
  - b) Casseroles, roasts, grills, puddings
  - c) Foods with a large vegetable content e.g. Italian, Chinese, Lebanese
  
3. If someone gave you a luxury cake from the cake shop, how would you be most likely to eat it?
  - a) Non-stop, very quickly, straight from the box at the first opportunity.
  - b) Save it for later and then have a big slice or two.
  - c) Eat a small slice later and savor every mouthful.
  
4. Do you ever eat while walking along the street or around the school?
  - a) Often
  - b) Sometimes
  - c) Never
  
5. When you buy a 'treat' food, in what way will you be most likely to eat it?
  - a) Alone – I want it all for myself.
  - b) As an occasional 'reward'.
  - c) Share it with friends.

### **Results:**

If you answered mostly a) you are probably a food addict.

If you answered mostly b) you are not a food addict. You love food and possibly eat too much of the wrong foods sometimes.

If you answered mostly c) you are probably in control of what you eat.

## 2C. Habits for good digestion

1. Chew your food well.
2. Eat slowly and be relaxed while you are eating.
3. Don't walk around while eating.
4. Don't eat a large meal before going to bed. This is the time when you are not doing exercise to burn it off. It causes weight gain and food doesn't digest as well when you are asleep.
5. Don't drink with meals. This dilutes the digestive juices that are trying to do their job of breaking food down.
6. Drink plenty of water between meals.
7. If you are starving when you come home from school, don't eat too much. Ask Mum to prepare an early dinner instead.
8. Don't over-eat.
9. Eat fiber by eating plenty of vegetables and some fruit.

### Why do we need good digestion?

Good digestion helps us to have:

1. Good bowel habits
2. Good absorption of nutrients. (This means that the nutrients get to the cells to do their work).
3. A good colony of beneficial bacteria in the gut, which help fight the bad bugs.
4. A stronger immune system.

### Challenge:

How can YOU personally improve your digestion?

Write a list of things you can do.

## 2D. Caffeine

One of the negative effects of caffeine is that small amounts of caffeine taken daily, for example a cup of coffee a day can create physical dependence on caffeine. Without your daily dose of caffeine, you can end up with headaches, excessive sleepiness, a feeling like you can't function or flu like symptoms. Withdrawal from caffeine can take anywhere from a few days to a few weeks depending upon how much caffeine you customarily consume.

When caffeine intake is above 300 milligrams a day, about three cups of coffee or three to four cola drinks, the caffeine may at first make you feel energized. Yet one of the negative effects of caffeine is its ability to disrupt sleep cycles, causing less deep sleep, particularly when you have caffeinated beverages within a few hours of bedtime. So while you may be using coffee or other caffeine-laced beverages to "get you started" in the morning, you likely need this extra boost because you are getting inadequate sleep.

In 2006, studies on night shift workers found that those who consume caffeine at night are most prone to this effect. Since night shift work already disrupts normal sleeping patterns, caffeine intake may create more serious issues. Those who drink caffeinated beverages and work night shift, have a far greater likelihood of getting insufficient deep sleep during the day. This can result in a continued cycle of exhaustion and caffeine boosts, a greater dependence on caffeine, and more caffeine consumed, which only exacerbates the problem.

Certain people are also particularly caffeine sensitive and more likely to experience negative effects of caffeine. For example, some people will feel "buzzed" or hyped-up from one cup of coffee. Lower body weight tends to translate to higher likelihood of experiencing the negative effects of caffeine.

<http://www.wisegeek.com/what-are-the-negative-effects-of-caffeine.htm>



## Activities

1. In line two of this article, find two words that mean “addiction”
2. Caffeine is found in coffee, cola drinks, chocolate and regular tea to some extent (not herbal). Which of these do you think people in our society are most addicted to?
3. What are some of the negative effects of caffeine?
4. List some healthy alternatives to cola drinks.
5. “Diet” soft drinks have the added disadvantage of containing aspartame as a sweetener. Aspartame is not good for us. Look up Aspartame on your food additive decoder. How is this rated?
6. Sudden withdrawal from caffeine may cause headaches, tiredness and shakiness. What recommendations would you make to a person who is a heavy caffeine consumer and wants to quit.
7. What usually follows the energy “high” that caffeine gives?
8. Suggest a way to maintain a good energy level without the use of caffeine.

# TEST - Digestion, diets and addictive foods

## Answer True or False

1. Very low-carb diets are suitable as long-term diets.
2. A very low-fat diet is the best diet for losing weight.
3. Diet pills may prevent us from absorbing the important fat-soluble vitamins A, D, E & K.
4. Complex carbohydrates give you more sustained energy than refined carbohydrates.
5. Drinking with meals is beneficial because it helps to wash the food down.
6. Eating a large meal in the evening is best for losing weight.
7. A cup of coffee before bed helps you to have a good night's sleep.

## Answer each question with a single word:

8. Eating cane sugar and white flour products cause a rapid rise/fall in blood sugar. \_\_\_\_\_
9. The "high" that sugar gives depletes the body of vitamins and \_\_\_\_\_.
10. For good digestion it is important to \_\_\_\_\_ food well.
11. An example of a lifestyle disease is \_\_\_\_\_.
12. The constant cycle of "highs" and "lows" brought about by caffeine can have the effect of making us feel \_\_\_\_\_.
13. Sources of caffeine are coffee, regular tea, chocolate and \_\_\_\_\_.
14. It is best not to snack in between meals so that the digestive system can \_\_\_\_\_.
15. If you are *really* in need of a snack in between meals, then a good one to have is \_\_\_\_\_.
16. People sometimes eat comfort foods, not because they are hungry, but because they feel \_\_\_\_\_.
17. An example of an addictive food is \_\_\_\_\_.

18. A sensible eating diet includes plenty of \_\_\_\_\_, fruits, complex carbohydrates, good quality protein and good fats.

**Circle the best answer:**

19. For good digestion and sustained energy throughout the day, eat:
- a) a small breakfast, a small lunch and a large dinner.
  - b) a large breakfast, a good healthy lunch and a light or early dinner.
  - c) a light breakfast, a large lunch and a large dinner.
20. Anaphylaxis is:
- a) a life-threatening allergic response to a particular food
  - b) an intolerance to a food such as gluten in wheat
  - c) a weight-loss diet

**Score:**

## Unit 3: Exercise

### 3A. Types of exercise

There are two basic types of exercise: cardiac exercise and weight-bearing exercise.

#### Aerobic exercise

This type of exercise gets your heart pumping. You may start puffing as your body uses up oxygen. The blood, which carries oxygen, flows through your arteries faster than when you are at rest. The blood delivers the necessary oxygen to the cells.

Aerobic exercise is usually performed at a low to moderate level of intensity over a sustained period of time. Running, playing tennis, climbing stairs, cycling and swimming are example of aerobic exercise.



Some of the benefits of doing regular aerobic exercise are:

- Stronger heart: the heart muscle is strengthened and enlarged.
- Increase of the total number of red blood cells in the body, to facilitate transport of oxygen throughout the body
- Improved breathing: the muscles involved in respiration are strengthened, to facilitate the flow of air in and out of the lungs.
- Improved muscle health: Aerobic exercise stimulates the growth of tiny blood vessels (capillaries) in muscles. This helps our bodies more efficiently deliver oxygen to muscles, can improve overall circulation and reduce blood pressure and remove irritating metabolic waste products such as lactic acid from the muscles.
- Weight loss: Combined with a healthy diet and appropriate strength training, aerobic exercise may help lose weight.
- Disease reduction: Extra weight is a contributing factor to conditions such as heart disease, high blood pressure, stroke, diabetes and some forms of cancer. As weight loss occurs, the risk of developing these diseases decreases.
- Improved immune system: People who exercise regularly are less susceptible to minor viral illnesses such as colds and flu. It is possible that aerobic exercise helps activate your immune system and prepares it to fight off infection.
- Improved mental health: Regular aerobic exercise releases endorphins, our bodies' natural painkillers. Endorphins also reduce stress, depression and anxiety.
- Increased stamina: Exercise may make us feel tired in the short term, i.e., during and right after the activity, but over the long term it will increase stamina and reduce fatigue.

## Anaerobic Exercise

Anaerobic exercise is the type of exercise that enhances power and builds muscle mass. This type of exercise is weight-bearing exercise performed in short bursts of about 2 minutes. It is also called strength training.

Anaerobic exercise strengthens and builds skeletal muscles. Here are some activities for anaerobic exercise: the use of dumbbells, weight stacks or exercise machines for body building.

Some of the benefits of anaerobic exercise:

- improvement in overall health and well-being including increased bone, muscle, tendon and ligament strength, toughness and endurance
- improved joint function
- reduced potential for injury resulting from weak muscles
- improved cardiac function
- conversion of fat to muscle
- decrease in risk of osteoporosis
- improvement in coordination and balance.



### Caution

Whether you are doing aerobic or weight-bearing exercise, be careful not to over-do it! Listen to your body and use common sense.

It is NOT a good thing to suddenly go from being completely sedentary to undertaking a marathon run. Also, it can be dangerous to lift weights that are too heavy for you. Build up gradually and undertake exercise suited to your level of fitness. Find the right level of activity that suits your body and take it at the right pace. You will find that working up a sweat stimulates the release of chemicals in the body that make you feel good.

### Activity 1:

#### How fit are you?

How long does it take for your body to recover from exercise? The fitter you are, the faster your heart rate will return to normal.

#### What is a normal heart rate?

For adults 18 and older, a normal resting heart rate is between 60 and 100 beats per minute, depending on the person's level of fitness. For children ages 6 – 15 the normal resting heart rate is between 70 and 100 beats per minute. (Reference: [www.livescience.com](http://www.livescience.com))

#### 1. Take your pulse rate.

- First try to find the pulse in your wrist.

- Now sit quietly and count the number of times your pulse beats in 1 minute, (or count the beats in 15 seconds and multiply by 4.) Record your pulse rate at rest.

**2. Now do some vigorous exercise for 2 minutes.**

- Note what is happening:
- Exercise makes you breathe faster and also makes your pulse beat faster. This means that your heart is beating faster.
- You breathe faster because you need more oxygen. Your heart beats faster to pump more blood around your body. This blood takes oxygen and nutrients to your muscles.

**3. Take your pulse rate again and record it.**

**4. Now sit quietly.**

**5. Keep taking your pulse rate every minute until your pulse rate is back to normal. (This is called the heart recovery rate.)**

**6. Make a bar graph to show your results:**

Heart beats/min

200  
180  
160  
140  
120  
100  
80  
60  
40

1 minute   2 minutes   3 minutes   4 minutes   5 minutes

**What is a normal heart recovery rate?**

According to cardiologist Dr. Michael Lauer from Cleveland Clinic, what happens in the first minute is most important. Once you stop exercising, your heart rate should drop by about 20 beats during the first minute. People who have a reduction rate of 12 or less during that first minute are not at a good level of fitness.

[www.livestrong.com/article/448974-how-long-after-working-does-your-heart-rate-return-to-base/](http://www.livestrong.com/article/448974-how-long-after-working-does-your-heart-rate-return-to-base/)

**Activity 2:**

Draw up a weekly exercise plan for yourself that gives a balance of aerobic and anaerobic exercise.

### 3B: Fitness

Here are some definitions of fitness.

1. Good health, or physical condition, especially as the result of exercise and proper nutrition.
2. The ability to function efficiently and effectively, to enjoy leisure, to be healthy, to resist disease and to cope with emergency situations.
3. Your health at its very best.

Which definition of fitness do you prefer and why?

Being fit includes every aspect of your health – not just physical but your emotional and mental well-being. Healthy eating, drinking water, exercise and adequate sleep are essential to being fit.

Being fit gives you:

- energy to be more productive and do things that are important to you.
- a positive outlook to handle the mental and emotional challenges that come our way, and to deal with stress.
- reduced risk of many health problems, including heart disease, cancer and diabetes.
- the opportunity to look and feel at your best.
- physical stamina to protect yourself in an emergency.
- a better chance for a having quality of life and perhaps a longer one too.

Reference: The American Dietetic Association

Here are some components of fitness:

- **Strength** - the extent to which muscles can exert force by contracting against resistance (e.g. holding or restraining an object or person)
- **Power** - the ability to exert maximum muscular contraction instantly in an explosive burst of movements. The two components of power are strength and speed. (e.g. jumping or a sprint start)
- **Agility** - the ability to perform a series of explosive power movements in rapid succession in opposing directions (e.g. zigzag running or cutting movements)
- **Balance** - the ability to control the body's position, either stationary (e.g. a handstand) or while moving (e.g. a gymnastics stunt)
- **Flexibility** - the ability to achieve an extended range of motion without being impeded by excess tissue, i.e. fat or muscle (e.g. executing a leg split)
- **Local Muscle Endurance** - a single muscle's ability to perform sustained work (e.g. rowing or cycling)
- **Cardiovascular Endurance** - the heart's ability to deliver blood to working muscles and their ability to use it (e.g. running long distances)

- **Strength Endurance** - a muscle's ability to perform a maximum contraction time after time (e.g. continuous explosive rebounding through an entire basketball game)
- **Co-ordination**- the ability to integrate the above listed components so that effective movements are achieved.

Of all the nine elements of fitness, cardiac respiratory qualities are the most important to develop as they enhance all the other components of the conditioning equation.

<http://www.brianmac.co.uk/conditon.htm>

### **Activities:**

1. List some benefits of being fit.
2. What is cardiac-respiratory health and why is it important?
3. Which aspects of your fitness could be improved?
4. How can being fit help us to serve God better?

## Body Mass Index

Part of being fit is to be a healthy weight for your height. This is called *Body Mass Index*, (BMI). You can find out your BMI by using the following equation.

### How to calculate your BMI

Take your weight (in kilograms) and divide it by your height (in meters) squared. i.e.  $\text{kg} / \text{m}^2$

A value of 25 or greater indicates over-weight and a higher risk of weight-related illnesses. A value of 30 or greater indicates obesity.

If you do have a BMI of over 25, you may like to take steps towards lowering it, to avoid future illness. People carrying too much excess weight are more prone to diabetes, heart disease and cancer in later life. These are called lifestyle diseases.

Being the right weight for your height is important, but the distribution of fat and muscle are also important. Exercising will help you maintain a good fat-muscle ratio.

## Activity

Calculate your own BMI. First you will need to measure your **weight** and your **height**.

This is personal information and does not have to be shared with others. However, it is good information for YOU to know, and if you need to improve your BMI you can work on it.



# TEST - Exercise

## True or false:

1. Exercise can help maintain a good fat to muscle ratio.
2. Aerobic exercise is weight-bearing exercise.
3. Anaerobic exercise gets the heart and lungs working faster.

## Answer with a single word:

4. An example of an exercise that gets the heart pumping faster is \_\_\_\_\_.
5. An example of an exercise to improve muscle strength is \_\_\_\_\_.
6. Fitness gives you energy, a positive outlook on life, physical stamina and reduced risk of \_\_\_\_\_.
7. Fitness is when your health is at its very \_\_\_\_\_.

## Circle the best answer:

8. BMI stands for:
  - a) body max indicator
  - b) body margin indicator
  - c) body mass index
9. The equation for calculating BMI is:
  - a) weight in kg. divided by height in metres<sup>2</sup>
  - b) height in cm divided by weight in kg<sup>2</sup>
  - c) weight in kg multiplied by height in metres<sup>2</sup>
10. People with the following BMI are at high risk for contracting lifestyle diseases:
  - a) >18
  - b) >25
  - c) >20

## Score:

## Unit 4: Water

Pure water is best for cleansing the system. If you feel like the occasional warm drink, then a cup of herbal tea can be a substitute for traditional tea and coffee. Herbal teas, and Chinese green teas, are beneficial, while regular tea and coffee contain caffeine which undermines the efficiency of the liver and kidneys.

Fizzy drinks deplete the body's calcium stores. When we drink fizzy drinks, calcium is drawn out of bones in order to neutralize the acidity of the high phosphorus level in the fizz. Cola drinks contain caffeine and diet drinks contain the artificial sweetener, aspartame. If you have to choose between the sugar in regular drinks, or the artificial sweetener, aspartame, choose the sugar. Not that sugar is good for you, but just not as damaging as aspartame!

Most of us are aware of the importance of water. You die after just three days without it! However, many people are under the misconception, that if they drink tea, coffee and soft drinks, they are getting enough water, because these drinks contain water. These drinks are actually diuretic in their effect. That means they are water-expelling. They take water out of the cells and eliminate it through the kidneys. This happens because the mostly acidic composition of tea and coffee requires the body to give up water in order to eliminate their harmful residues.

Dr. Batmanghelidj did some outstanding work on the therapeutic value of water. Dr. Batmanghelidj, as a political prisoner in a Tehran prison, cured other prisoners by using water alone. He treated prisoners with water alone, because that was all he had available. Later, after escaping to the U.S.A., he was able to continue his research. Dr. Batmanghelidj proved that water *does* have therapeutic value, and that dehydration creates the foundation for many diseases. (Batmanghelidj F. *Your Body's Many Cries for Water*)

Water is essential for brain function, bone function, nerve function, and is essential for the body to carry out many chemical reactions. It is required for cellular energy, digestion, detoxification and for maintaining the right blood pH level. The body uses water to buffer acidity. Lack of it creates all manner of illnesses, including allergies, depression, heartburn and ulcers. Most of the population have become chronically and dangerously dehydrated due to the decision that water is too bland to drink, and needs replacing with tea, coffee and fizzy drinks.

We should drink between meals but not with meals. Drinking with meals interferes with digestion by dilution of the digestive juices. It is also best to start the day with 2 glasses of water, or warm water with a slice of lemon. The body needs plenty of liquid for cleansing and flushing the system. We need to drink approximately 6-8 glasses of water per day. (This varies according to body weight, temperature and how much exercise we undertake.)

Try to carry your own water bottle with you. You can buy water bottles that are 'BPA free' That means that the plastic is a better kind of plastic, which does not break down and get into the water. If you keep using old water bottles from the supermarket, you may get plastic residue in the water.

## Activities:

1. Name a fizzy drink containing aspartame.
2. What effect do fizzy drinks have on the bones?
3. How long can you live without water?
4. Drinking 8 cups of coffee a day will not give your cells enough water. Why not?
5. What did Dr. Batmanghelidj prove?
6. What are some of the functions of water in our bodies?
7. How much water should we drink per day?
8. When is the best time to drink water?



# TEST - Water

## True or false:

1. You can live for only 14 days without water.
2. Water is essential to brain function.
3. We should drink between meals.

## Answer with a single word:

4. Fizzy drinks can weaken bones because they are too acidic/alkaline.
5. \_\_\_\_\_  
Teenagers and adults need \_\_\_\_\_ glasses of water per day.
6. Drinking with meals interferes with \_\_\_\_\_.

## Choose the best answer

7. When our cells do not have enough water we are in a state of:
  - a) fatigue
  - b) shock
  - c) dehydration
8. You can die if you go without water for more than
  - a) one day
  - b) three days
  - c) seven days
9. The problem with cheap plastic water bottles is that
  - a) they break easily
  - b) they don't hold enough
  - c) chemicals from the plastic can go into the water.

## Score:

# Unit 5: Sunlight

## 5A. Sunlight for health

God created the sun for quite a few important reasons. Life depends on it. Only a few plants such as certain fungi can survive without it. So let's not avoid the sun altogether for fear of getting skin cancer. Sunlight can actually help prevent cancer. But just make sure you show wisdom in when you go out in the sun, and do all you can not to get sun burnt.

Here are some important reasons why we need sunlight:

### 1. Food Energy

Plants have specific organs in their cells that convert sunlight to food energy through a process known as photosynthesis. A plant will capture the sun's rays in a chloroplast through a chemical reaction and this conversion gives plants the ability to supply calories to all life. It is by plants that cows are fed and then the humans that feed on the cows. In this way, sunlight provides the source of food for all life on earth.

### 2. Vitamin D

One of the amazing things that sunlight provides for us is Vitamin D. It is absorbed through the skin and converted to a state that the body can use. It usually only requires about thirty minutes of sunlight a day to acquire a minimum dose. Vitamin D is important for the creation and maintenance of bones. It is involved in the use of calcium in the body and performs many other important jobs.

### 3. Happiness

There have been studies that show that depression occurs in people during the change of seasons. As winter approaches and the earth tilts away from the sun, the days become shorter. This means less sunlight is available for our use. Many people find themselves depressed at this time of year, and the cause has been linked to the lack of sunlight. Indeed, people who sit under lamps that recreate the light spectrum of the sun have reported feeling happier and more energized. Sunlight also stimulates the pineal gland deep in the brain. This gland regulates our sleep/wake cycles and triggers our bodies to activity or restful sleep.

### 4. Warmth

Life on this planet would not be possible without the warmth that the sun provides. Mercury and Venus have temperatures much hotter than most earth organisms could handle. If any water existed on these planets, it would be quickly burned off as steam. Yet even Mars which is the next furthest than earth from the sun is so cold that it is also uninhabitable. If water would

exist on Mars and planets further out, they would be rocks of solid ice. In fact, some of the planets are ice. Our moon gets some of the rays of the sun, but is still so much colder than what we have here. A combination of the radiant light of the sun creating direct warmth and the atmosphere retaining and distributing that heat allows plant and animal life to thrive on this planet.

## 5. Light

It takes the light of the sun eight minutes to reach us. We need the sun's light to enjoy time outdoors during the day and to grow our crops. Without the light of the sun, there would not be any life on earth. There would be heat to sustain us. Without the life giving light of the sun we could not even exist.

## 6. Rain

If it were not for the sun evaporating the water off of bodies of water, we would not have rain or snow as we know it. The water that is turned to moist air rises into the atmosphere where it is affected by temperature and then falls as rain, (or hail or snow). Without the sun, there would be droughts and most of the world would be a barren desert.

Reference: <http://sunlightenment.com/six-important-things-the-sun-does-for-you/>

Here comes the sun: Six Important things the sun does for you, by Lynda Lampert

Source: <http://www.helium.com/items/1225885-vitamin-d-sunlights-effect-on-the-body>

## Activity

Take two identical plants Place one in sunlight and the other in a darkened place such as a cupboard. Give them identical conditions: soil, water and room temperature, the only difference being that one has a light source and one does not. Draw up a table and record your observations over a period of two weeks.



## 5b. Sun, but not too much!

*What kind of skin do you have?*

If you have fair skin, or lots of moles and freckles, you'll need to take extra care to look after your skin.

Spending too much time in the sun is harmful so we should all follow a special code that shows us how to enjoy the sun while making sure we stay safe.

**S**pend time in the shade between 11 and 3

**M**ake sure you never burn

**A**im to cover up with a hat, clothing and sunglasses

**R**emember to take extra care with children

**T**hen use a sun screen cream if you have to be in the sun.

*Where can you find shade?*

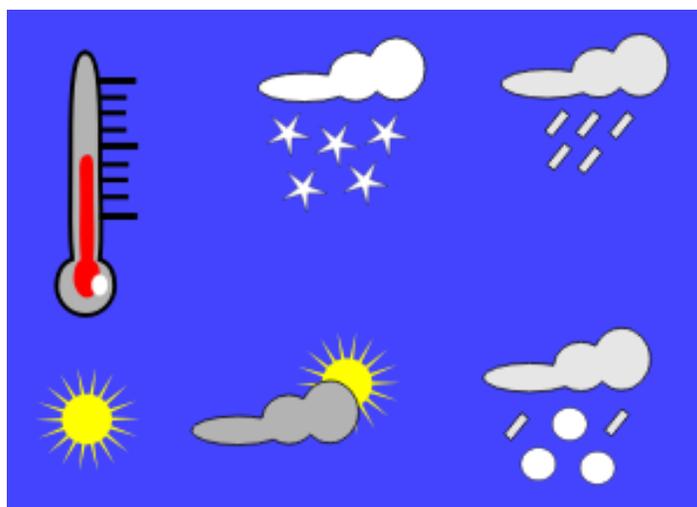
You can find shade under trees, canopies, umbrellas, or indoors.

It's easy to get sun burnt, even when you're not expecting to. But it's really important that you don't. Because you can't feel UV rays it's easy forget that they are there but remember that you can still burn on a cloudy day. Covering up with a t-shirt is a good way to protect your shoulders and upper arms.

*True or False?*

You can't get sun burnt on a cloudy day.

The answer is FALSE. Even if the sun doesn't feel hot you can still get sun burnt!



# TEST - Sunlight

1. Sunlight provides the food source for:
  - a) plants
  - b) animals
  - c) all life
  
2. The key vitamin for health that we get from the sun is:
  - a) Vitamin B
  - b) Vitamin C
  - c) Vitamin D
  
3. The Earth is unique because:
  - a) It is just the right distance from the sun to support life
  - b) It has water
  - c) It has gravity
  
4. Without the sun the earth would be a very dry place because
  - a) We need light to make clouds
  - b) The sun evaporates water from seas and lakes to form clouds and then rain
  - c) There would be no deserts
  
5. True or false:  
You cannot get sunburned on a cloudy day.

## Unit 6: Food Additives and Household Toxins

### 6A. Food additives

Use your *Food Additive Decoder* sheet to assess the healthfulness of processed foods, e.g. sweets, drinks and savory snack foods. Collect food wrappers, boxes and packets. Look at the ingredients list and see whether it contains numbers. These are food additive numbers. Now look up your decoder and see which category the additives fall into:

1. **Green** – safe
2. **Blue** – no adverse effects known
3. **Yellow** - May cause health problems
4. **Red** - Known to cause health problems in some people

Modern foods contain food additives such as food colors, preservatives and flavor enhancers. Many of the artificial food colors are strongly linked to ADHD, allergies and even cancer. Here are some examples of food additives that are best avoided:

#### **Yellow food coloring:**

*Acid yellow (102)* - derived from coal tar. 80% of hyperactive children are allergic to it. It is believed to cause allergic reactions in 15% of the general population. Known effects are asthma, hyperactivity, hay fever, blurred vision, breathing problems, skin irritation, wakefulness in young children.

*Sunset yellow (110)* – toxic waste from petrochemical industry. A known carcinogen.

#### **Red food coloring**

*Allura Red coloring (129)* - a coal tar dye. It may cause allergic skin conditions. It increases the heart's rate and is implicated in behavioral problems. It should be avoided by persons suffering from asthma. Listed problems associated with *Allura Red* are tumors and lymphoma. When given to mice, they developed cancer of the lymph glands.

*Amaranth (123)* – All women of childbearing age, especially those in the first 3 months of pregnancy should avoid this color. It may provoke eczema, is harmful to asthmatics and causes hyperactivity. It has caused birth defects and fetal deaths in some test animals. Implanted in mice bladders it produced cancer.

#### **Flavor enhancers**

*Mono Sodium Glutamate (MSG 621)* – may be found in packet soup, flavored noodles, soy sauce, chicken, beef, pork or smoke flavors. Potential effects: heart palpitations, nausea, depression, headache, migraine, asthma.

### **Artificial flavors**

And what's really in those artificial flavors? Here are some examples of flavorings you could find in ice-cream:

- “Cherry” – aldehyde C17 – an aniline dye used in plastic and rubber.
- “Vanilla” – piperonal – a chemical used to kill lice.
- “Pineapple” - ethyl acetate – cleans leather, and its vapors are known to cause chronic lung, liver and heart damage.
- “Nut” – butylaldehyde – used in rubber cement.
- “Banana” – amyl acetate – a paint solvent.
- “Strawberry” – benzyl acetate – a nitrate solvent.

### **Artificial Sweeteners**

Aspartame, also known as ‘NutraSweet’, or food additive no. 951, contains Aspartic acid and Methanol. Aspartic acid can cause brain damage, and Methanol breaks down to formaldehyde, which spreads throughout the vital organs. Aspartame can trigger or mimic many diseases, including A.D.D., epilepsy, fibromyalgia, lupus and M.S. Aspartame is the sweetener in diet drinks, such as ‘diet cola drinks’, and is the sweetener in most ‘sugar-free’ sweets and chewing gum.

### **Preservatives**

Some preservatives are labeled as ‘antioxidants’. Most of us are aware of the wonderful health benefits of antioxidants. However, there are good antioxidants and bad antioxidants. Antioxidants like grape seed and Vitamin E are free-radical scavengers, protecting us from cancer. However, certain preservatives in foods, labeled as antioxidants, can be detrimental to our health.

Examples of bad anti-oxidants are:

*Calcium Propionate (282)* - a preservative commonly found in bread. May cause asthma, migraine, fatigue, aggression and learning disorders

*BHA (butylated hydroxyanisole – 320)*

This additive may be found in dried milk powder and powdered mashed potato. It may cause dermatitis, asthma, skin blisters, weakness, fatigue and cancer. Derived from Coal Tar Dye, it is reported to be the most widely used additive in the U.S. It is listed as a carcinogen and suspected of being a neurotoxin. It raises cholesterol levels in the blood and can cause hyperactivity.

*BHT (butylated hydroxytoluene – 321)* – similar effects to BHA.

Sulfites – 220, 221 and 222 – these are a group of sulfur-based chemicals, also widely used as antioxidants in foods. According to the FDA (Food & Drug Administration in USA), as many as 1 in 100 people are extremely sensitive to sulfites and may have difficulty in breathing, develop hives, diarrhea, abdominal pain, cramps and dizziness, wheezing and vomiting. Sulfites are commonly used in cooked chips and preserved meats.

Some food additives can have the following effects on some people: hyperactivity, anti-social behavior, short attention span, lack of muscle co-ordination, skin disorders, asthma and allergies.

**Other problems with food additives:**

Food preservatives may also have an antimicrobial effect. This means that they stop the action of the good bacteria in our digestive tract. These helpful bacteria break down food and fight the bad bacteria. Without these helpful bacteria in the gut, our immunity is lower.

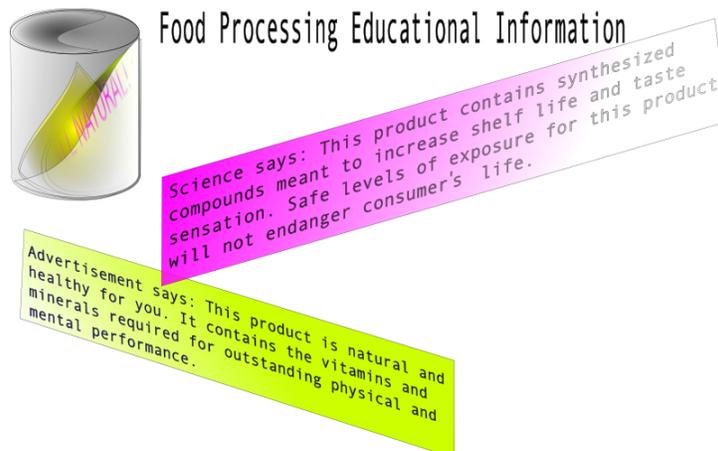
Foods that contain high levels of food additives usually contain lower levels of nutrients. Foods with multiple food additives in the one product will have a multiplied effect. They react with each other to give an overall negative effect.

You may be saying, “I eat sweets every day containing bad food additives and I suffer no harmful effects.” Not everyone who consumes food additives is affected. Our bodies do their best to eliminate toxins through the excretory system. But sometimes the body can’t get rid of them all. How would you know if a food additive was having an ill-effect? You may feel tired, have asthma, get colds easily, and have poor digestion. Would you know that it was toxins in your system causing that? Of course not. You would think of other causes before you would think of food additives.

There are many people who have cleaned up their diet by eliminating foods that are potentially a problem, and switched to a natural plant-food diet. By doing this many people are healed of their problems and experience vitality. We can think of the body as having a bucket inside. That bucket holds the toxins that we consume. We have no ill-effect because the toxins are going into the bucket and not into the rest of the body. This goes on for years. But one day the bucket gets so full that it overflows. Where does the toxic waste go? Now it goes into our body and we see the results in allergies, fatigue and illness. When we are young we are resilient. But youth does not last forever.

References:

1. Taubert, P.M. *Your Health and Food Additives*, Aust 2000
2. Reekie, Lillian, *Hidden Dangers*, Aust 2002.
3. Dingle, Dr. P., *My Dog Eats Better Than Your Kids*, Aust 2008
4. *The Australian and New Zealand Food Additive Decoder*, 2000
5. Statham, B., *The Chemical Maze*, Aust, 2006



## Activities:

### Food Additives

1. The safety of food additives can be rated as: **GREEN** for safe; **BLUE** for probably safe; **YELLOW** for caution and **RED** for potentially having bad effects on your health. Find a product that lists additives on the label. Using your **Food Additive Decoder**, do an assessment of the safety of the product.
2. What is the main preservative to avoid when buying bread?
3. Why is it important to buy ice-cream with natural colorings / flavorings?
4. What happens when food additives upset the balance of friendly bacteria in the gut?
5. List some diet drinks containing aspartame.
6. What are some problems with aspartame?
7. What would you say to a person who thinks they can consume artificial food additives regularly because they currently suffer no harmful effects?

8.

## 6B. Environmental toxins

After World War 2, thousands of new chemicals were released into the environment. They had uses far beyond warfare. Pesticides, plastics, fertilizers and preservatives found their way into the products we use every day – not just food but products we put on our skin. The skin was once thought to be the perfect barrier to keep out all substances. But as time went on it was discovered that the skin was a carrier, not a barrier. Medication patches were developed, such as the patches used to help smokers kick their addiction. How do these work? The patches are impregnated with the medication known to produce the desired effect. When placed on the skin, the substance is absorbed through the skin and into the blood stream.

Although this new discovery has been made, no one has done anything to stop toxic chemicals going into products that we put on our skin. It would cost the manufacturers too much money to produce non-toxic products. So toxins in skin-products have remained. However, some products are safer than others. We can do our best to minimize the effects of toxins by buying products from a health shop rather than the supermarket, or just cutting down on the number of products we use on our skin.

Toxins can also enter our bodies by breathing them in, or ingesting them. Over time, exposure to environmental toxins can cause allergies, fatigue and a depressed immune system in some people.

Some common toxins found around the home are fly sprays, garden pesticides, herbicides, household cleaners, paints and glues. Exposure to these environmental toxins adds the toxic waste in the imaginary “bucket” inside us. We can cut down on problem chemicals by using a fly swat instead of fly spray, and by using safer or fewer cleaning products. We can make things clean by just scrubbing harder and by using ordinary substances like vinegar and bi-carb soda. A few drops of eucalyptus oil added to water makes a good disinfectant.

We can minimize the effects of pesticides on fruits and vegetables by washing or peeling fruits and vegetables before eating them.



## **Activities:**

### **Environmental Toxins**

1. Find the dictionary meaning of 'toxin'
2. How do environmental toxins get into our bodies?
3. What effects can environmental toxins have on some people?
4. How can we minimize the effects of toxic chemicals that enter through the skin?
5. List some toxic chemicals found in and around the home.
6. How can you cut down on some of these?
7. How can we minimize the effects of agricultural pesticides?

## 6C. Food allergies and intolerances

Article by John Elder

### Danger at the Dinner table

Food intolerances and allergies seem to be on the rise. Five percent of all babies and 1 per cent of adults have some kind of food allergy. Seafood allergies often present themselves during the festive season. “Where peanut allergies usually begin in childhood, a potentially lethal allergy to shellfish can develop at any time,” says Professor Jo Douglas, head of the asthma service at Melbourne’s Alfred Hospital.

An allergy is potentially fatal and the offending food is to be avoided at all costs. Even a small portion can have catastrophic results.

In ancient times when mankind wandered the plains, food intolerances meant eating a poisonous berry. During the Depression years kids were told to eat everything that was put on the plate – especially if you were at someone else’s place. Fussy eaters were told: “Eat up. It won’t kill you.”

Those were the last days of human history when most people were able to eat just about anything and not suffer. Now it appears that anything you can put in your mouth is causing someone a problem. At [www.imupro.com.au](http://www.imupro.com.au), a website for a company selling a food-intolerance test through pathology labs, you’ll find 272 foods listed as potential troublemakers.

ImuPro’s managing director, Kevin Grundy, says business has tripled in the past years with 60 to 70 people a month taking the test – which in its most comprehensive form costs \$995. “We’ve only been going since 2006 and the interest being generated is phenomenal,” Grundy says.

At [coeliac.com.au](http://coeliac.com.au), you’ll read that about 15% of the population has some sort of gluten intolerance – gluten being a protein in wheat, rye, barley and oats.

And the Food Intolerance Network, founded by former teacher, Sue Dengate, claims 1000 hits on its website a day, with 1.5 million people having logged on so far for information about food additives and intolerances to naturally occurring food chemicals. Dengate says “It’s food additives – which increasingly became part of the national diet in the ‘70s – that are causing many problems.”

Salvatore Oppedisana, head chef at Saganaki Restaurant, Melbourne, believes the increase in food intolerances is partly because “the quality today is not what it used to be. There’s too much processed stuff that housewives pick up at supermarkets...Most people are not eating a balanced diet.”

A former hospital head cook, Oppedisano says, “Eating food low in nutrition is like trying to run a car on bad oil. As you get older the body isn’t being sustained by the foods that are available.”

Marc Cohen, professor in complementary medicine at RMIT, Melbourne, says “If the integrity of your gut isn’t in place, allergens can cross into the bloodstream.”

Dietitian Jane Dostine, when asked why food intolerances are now a mainstream issue, says “We had a much simpler diet 20 years ago...our diet has changed dramatically in one generation from something that was basic to one of more exciting flavors. And there are complications that go along with that.”

### **Not so nuts about the pudding?**

People with food allergies need to plan for Christmas socializing, says Professor Jo Douglas. She advises:

- Notify family, friends or restaurants ahead of time about restrictions in your diet.
- Have an anaphylaxis plan – including the carrying of an EpiPen. Over a five-year period, most people with a nut allergy will be exposed to food containing nuts, despite actively avoiding it.
- When confronted by food you’re not sure about, do a touch test by putting a fingertip on the food and then touching the lips.

## Activities:

1. How do we know that food intolerances are on the rise?
2. For some people with food allergies, eating even a small amount of that food can be fatal due to anaphylaxis.

### **Anaphylaxis**

#### **Definition**

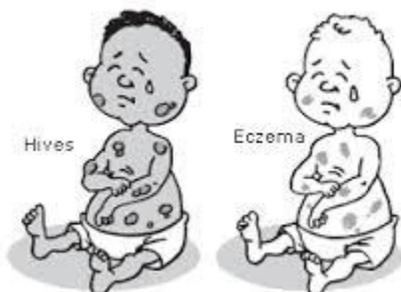
Anaphylaxis is a rapidly progressing, life-threatening allergic reaction.

#### **Description**

Anaphylaxis is a type of allergic reaction, in which the immune system responds to otherwise harmless substances from the environment. Unlike other allergic reactions, however, anaphylaxis can kill. Reaction may begin within minutes or even seconds of exposure, and rapidly progress to cause airway constriction, skin and intestinal irritation, and altered heart rhythms. In severe cases, it can result in complete airway obstruction, shock, and death.

Name a food that can cause anaphylaxis.

3. Food intolerances are different to allergies. They do not cause anaphylaxis, but may cause asthma, eczema and digestive problems. List some common foods that many people have intolerances to.
4. Give the reasons suggested by experts in this article, for the rise in food intolerances.
  - a) Sue Dengate
  - b) Salvatore Oppedisana
  - c) Marc Cohen
  - d) Jane Dostine
5. When Jane Dostine says that there are more exciting flavors around today, what do you think she means?
6. How can people minimize the risk of developing food allergies and intolerances?



# TEST - Food Additives and Household Toxins

## Answer T or F

1. Chemical food additives in the RED category of the *Food Additives Decoder* will have an immediate negative effect.
2. Chemical food additives in the RED category of the *Food Additives Decoder* are always red in colour.
3. Some chemical food additives upset the beneficial bacteria in the gut.
4. There are links between some food additives and allergies.
5. A toxin is a substance that has a negative effect on our health.
6. The body usually gets rid of most toxins through the elimination system.
7. Toxic overload is when there are too many toxins for the elimination system to cope with.
8. The skin prevents all external chemicals from passing into the bloodstream.
9. Food additives listed in the GREEN category of the *Food Additives Decoder* are safe.
10. People who have a food allergy to peanuts can face death if they eat peanuts.
11. Food intolerances are just as common today as they were 50 years ago.
12. MSG can be found in ice-cream

**Answer each question with a single word:**

13. Many people have an intolerance to \_\_\_\_\_.
14. We might find MSG in \_\_\_\_\_.
15. Name a safe alternative to toxic cleaning products  
\_\_\_\_\_.
16. We can avoid using fly spray by using a fly \_\_\_\_\_.
17. Preservative 282, a common preservative in bread may cause  
\_\_\_\_\_ in some people.

**Circle the correct answer:**

18. What is aspartame?
  - a) a preservative
  - b) an artificial coloring
  - c) an artificial sweetener
  
19. What is MSG?
  - a) a flavor enhancer
  - b) an artificial coloring
  - c) an artificial sweetener
  
20. Thousands of chemicals were released into the environment
  - a) soon after World War 1
  - b) soon after World War 2
  - c) 200 years ago

**Score:**

## Unit 7: Substance abuse

### 7A. Types of drugs

Drugs are chemical substances which change the way the body functions.  
Drugs change the way a person behaves and feels.  
Drugs can be legal or illegal.

An example of a legal drug is a pharmaceutical drug which may be prescribed by a doctor for an illness. A pharmaceutical drug is prescribed to relieve the symptoms of pain or illness. However, over the long term, pharmaceutical drugs may have negative side effects.

Another type of legal drug is tobacco. Although cigarettes are legal, they have serious negative side effects.

Some drugs, such as the opium-based drug morphine, are used legally in hospitals for severe pain relief. But the same drug in the form of heroin is illegal.

Even coffee and cola drinks can be classified as legal drugs because they contain caffeine. So called "energy drinks" give a person a lift with caffeine, but do not provide lasting energy.

There are four different groups of drugs whether legal or illegal:

1. Analgesics (pain killers)
2. Hallucinogens (cause visions or hallucinations)
3. Stimulants (cause a high emotional state)
4. Depressants (calms a person down)

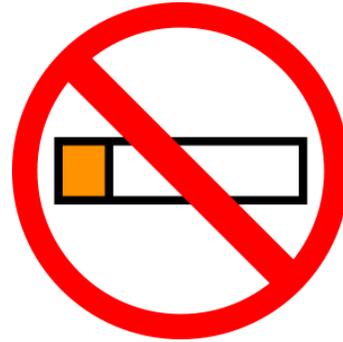
<b>Analgesics</b>	<b>Hallucinogens</b>	<b>Stimulants</b>	<b>Depressants</b>
Opium	LSD	Ecstasy	Alcohol
Heroin	Magic Mushrooms	Cocaine	Tranquilizers
Aspirin	Ecstasy	Tobacco	Cannabis
Morphine		Methadone (ice and speed)	
		Amphetamines	
		Caffeine	

## 7B. Cigarettes

The drug nicotine is found in tobacco. Nicotine is a stimulant, and is addictive. This means that once you start smoking, it is very difficult to stop.

But nicotine is not the only problem. Cigarettes also contain:

- butane (lighter fluid)
- cadmium (heavy metal found in batteries)
- toluene (in nail polish)
- ammonia (toilet cleaner)
- Methanol (rocket fuel)
- carbon monoxide (poisonous gas)
- arsenic (poison)
- methane (sewer gas),



Smoking damages your health and makes you more vulnerable to:

- Heart disease
- Heart attacks
- Cancer
- Strokes

Other negative side effects of smoking:

- yellow teeth
- bad breath
- body odour
- smelly clothes
- a waste of money
- food doesn't taste as good
- you quickly become out of breath when you exercise

People who do not smoke can be harmed by breathing in the smoke of others.

### Activities:

- Make an anti-smoking poster and show some of the reasons why you shouldn't smoke.
- Interview a smoker. Ask them why they started smoking, why they still smoke and whether they would like to quit. Make a report on your findings

## 7C. Alcohol

Alcohol is a drug that is legal in most countries. The age at which the use/sale of alcohol becomes legal depends on the culture and country. People may drink alcohol for many reasons, including to:

- Experiment
- Socialize with friends
- Relieve boredom
- Calm themselves down
- Forget worries or problems

The younger a person is when they start drinking alcohol, the more harm they will potentially do to themselves. Alcohol is a toxin, and even when consumed in small amounts, it can be harmful to the still-developing brain and body of a young person.

Alcohol is a depressant drug meaning it slows the time it takes to respond to things. Alcohol has the ability to affect your co-ordination and judgment. This is why it is illegal to drive when under the influence of alcohol. When drunk in small amounts it may make you feel more relaxed, however, taken in larger amounts it may cause you to vomit or pass out.

If you drink to excess you're likely to experience a number of physical effects, including:

- Hangovers
- Nausea
- Shakiness
- Vomiting and memory loss
- Injury to yourself
- Alcohol poisoning

Alcohol is a major cause of injury and death among young people. When you're drunk, you're more likely to put yourself in risky situations, like getting into a car with a driver who has been drinking, or being the perpetrator or victim of violence.

### **Long-term effects of regular alcohol use**

Continuous heavy drinking over a long period of time can lead to:

- Physical and psychological dependence on alcohol
- Significant damage to the brain and liver
- Risk of cancer of the mouth, throat or esophagus



- Possible increased risk of neurological disorders, heart problems, and sexual problems (especially male impotency)
- Emotional and mental health problems developing, such as depression and anxiety
- Problems at school, work and with relationships
- Increased possibility of acting in a violent way.

Alcohol and tobacco cause more deaths than any other drug.

## 7D. Cannabis

### Cannabis

Cannabis is also called Marijuana. It is the dried leaves and flower of the plant. It is normally smoked in the form of hand-rolled cigarettes.



#### *Short Term Effects*

Users may feel talkative and relaxed. They tend to laugh and giggle at things that are not funny to other people. Cannabis heightens the senses especially when it comes to music, color and taste. It increases the appetite and users often snack on junk food. Cannabis can bring about negative physical effects such as lack of coordination, increased pulse rate, decreased blood pressure, bloodshot eyes and a dry mouth.

#### *Long Term Effects*

Cannabis is an addictive drug which can cause mental illness. Use of cannabis is known to affect a person's short-term memory and impair their ability to concentrate. Users often cannot think logically and lose track of what they are saying. Larger doses cause confusion, restlessness, worry or panic. Hallucinations occur, when users may see, hear, feel, taste or smell something that is not there.

It also affects coordination and can make accidents much more likely to happen. If cannabis is taken with tobacco, then users often get addicted to the tobacco and smoking cannabis can lead to respiratory disorders and sometimes lung cancer. Many users find that cannabis is hard to kick.

#### *What do you think?*

Medical researchers have developed a form of Cannabis that has been trialed on people with severe medical conditions such as epilepsy and conditions involving nerve pain. Unlike Cannabis in its raw form, the medical drug does not cause hallucinations. Some people believe that this form of Cannabis should be made legal.

### **Activity:**

Should Cannabis be made legal for medical use? Give reasons 'for' and 'against' this argument.

## 7E. hard drugs

Hard drugs are those which cause severe addiction, and cause severe health problems, even death. Being addicted to a hard drug, especially heroin or cocaine, means that a person cannot cope without them. Their whole life becomes focused around buying and taking drugs.

### *Short Term Effect*

Heroin is a painkilling drug and in small doses can give the user a sense of warmth and wellbeing. But a very high this can cause the user to enter a coma and even be fatal.

### *Long term Effects*

Heroin is an extremely addictive drug. Some users report being hooked after only the first dose. If the user does not get the next dose of heroin they start to go through withdrawal. This means that they experience aches, hot and cold sweats, sneezing and spasms which peak after about three days. Because heroin is an addictive drug, users find that they need higher and higher doses just to feel normal. Those who start by smoking heroin often switch to injecting, because of their need for higher doses. This is extremely dangerous. It can lead to damaged veins, gangrene, higher risk of HIV and hepatitis. Overdose can cause death. Because heroin is so addictive, users find that the heroin rules their lives and that they end up stealing and committing other crimes just to get the money for the next fix.



## **Activities**

Make three action plans for helping someone who is addicted to:

1. alcohol
2. illegal drugs

*Think about:*

- Why people turn to these drugs for comfort?
- What does the desire for drugs show us about a person?
- How could you use the Bible help a person replace the need for drugs?

# TEST – Substance abuse

## True or False:

1. All drugs are illegal.
2. Cigarettes are addictive.
3. Cannabis can affect concentration.
4. Heroin is not very addictive.
5. Alcohol causes more deaths than any other drug.

## Unit 8 : Air

### 8A. Fresh air: Are You Getting Enough?

On average, how much of your day is spent outdoors? For many the answer will amount to minutes, as we go from one closed space to another. We live in our homes, we get into our cars on our driveways, we drive to more closed locations and at the end of the day, we come back home.

As the winter months moderate and the outside temperatures start to rise, some of us do try to spend more time outdoors. But our body's need for fresh air is not just a seasonal thing; we need enough fresh air every day.

There is no set amount of the "right amount" of fresh air we should get each day. But just be aware that you need it. Whether it is a half hour or a half day, there are so many ways to spend time out doors and make it fun. Perhaps a jog, a walk, taking a dog for a walk, throwing a Frisbee or even sitting outdoors can be the easiest and fun way to get outdoor exposure. Our lungs, skin and whole-body benefit so much from fresh oxygen.

Taking in fresh air is important for the health of our lungs. It may help us avoid respiratory tract infections like the cold, flu or bronchitis

#### **The Health Benefits of Fresh Air**

High oxygen levels increase the efficiency of almost all the reactions in your body. From losing weight to sleeping better at night, fresh air is a key component. High oxygen levels in the body have also been linked to decreasing cancer growth and preventing cancers all together. Our skin benefits, our lungs benefit, and due to so many reactions that depend on oxygen, every system in your body benefits!

Indoor air and outdoor air both contain oxygen naturally, but the quality is not the same. Some people say that they don't want to go outdoors or open their windows in the home out of fear of the pollution outdoors.

However, unless you live next to some combustion factory or it is a high alert smog day, the air outdoors is almost always better than that indoors. Here is the reason: Outdoors, there is a better dilution effect as more fresh air is available and thus the concentration of pollutants tends to be lower. Indoors, especially the air-tight way that most homes are built today, there is a higher ratio of pollutants to fresh air, and thus the air in your home is not high quality, unless it is regularly exchanged.

## Freshen Up Your Home

Here are some tips to make the best of your indoor air.

### 1. Do not use ANY air fresheners.

Advertising convinces us that if we do not use air fresheners in our home we are missing out on something essential. Nothing in fact can be further from the truth. All air fresheners, (whether a spray, a plug-in deodorizer or a scented candle), are a huge waste of money. None are safe.

They are adding chemical particles to your indoor air. This would not be so bad if you aired out your house on a daily basis, but most of us do not. Air fresheners actually pollute the air, not freshen it.

### 2. Open Your Windows

It is really that simple and free. If you have odor problems, simplest thing to do is open your windows. Ideally, our homes should be aired out daily all year round. Naturally some days may not allow for that, but even 5 minutes a day during a cold day, makes a big difference to the quality of air inside your house.

### 3. Establish a Hygienic Routine with Pets

Having pets inside can create odors. However, having pets does not have to mean turning your home into a chemical factory. Again, daily and thorough airing out of the house does wonders for freshening things up naturally.

If your pets have their own bed or rugs, wash those as regularly as needed. It is better for your pet too. Train your pets to stay on their own bed or rug and do not allow them on the furniture.

Reference: <http://www.evolvingwellness.com/essay/the-importance-of-fresh-air>

## Activities

- Make a table and record how long you spend outside over a period of a week, starting from today.
- Record the date.
- How might the time you spend outside vary over different months of the year?
- How can you improve your personal intake of fresh air?



## 8B. Air pollution

### How important is air?

Oxygen is a colorless, tasteless and odorless gas that forms about 21% of the Earth's atmosphere (by volume). All living things need the oxygen in the air to survive. Without the oxygen gas available in non-polluted air, the Earth would not have any living organisms. Humans cannot live without oxygen for more than a few minutes. Because air is essential to our survival, our bodies are constantly interacting with it. Air enters our bodies through our mouths and noses. Inhalation is the process of breathing air through the mouth and nose into our lungs. Once air enters the lungs, cells take the oxygen from the air and distribute it throughout the body. After using the oxygen, the body exhales and pushes out the remaining air (containing carbon dioxide) from our lungs.

Air supports other biological activities as well. Air allows us to hear as airwaves reach the ear and cause our eardrum to vibrate. Air allows us to see as light travels through air very quickly. Air allows us to smell as it carries tiny particles that make up odors.

Air is also necessary in many non-biological activities. Air helps distribute heat and water around the world. We can tell that air is at work when objects such as leaves, branches, flags, clouds are moving, and when thunder is crashing. There are many other objects that rely on air to move, too. An airplane uses air to help it take off from the runway, a bird needs it to fly, a sailboat needs it to move in the water, and a hot air balloon uses it to rise off the ground. Other uses for air include heating and cooling, recreation, energy and pollination.

### What Are Air Pollutants?

Clean air contains only the gases and water vapor needed to keep the Earth's environment healthy. Pollutants are substances, or even energy, that contaminate our air and harm living things (and some non-living things too). A high concentration of pollutants in the air is called air pollution. There are hundreds of pollutants that float around in the air that we breathe. Some come from natural sources, but most come from human activity.

Most major air pollutants are invisible, but large amounts of them can be seen as smog when they are concentrated in areas such as cities. Indoor air pollution is becoming a large concern because the people are spending more and more time indoors.

### Air Pollution Sources

Examples of Indoor air pollutants:

- Pesticides
- Dust
- Fungi
- Chemicals
- Animal hair
- Cigarette smoke

Examples of Outdoor pollutants:

- Smoke and fumes from factories and power stations
- Car exhaust fumes
- Gas / petrol stations
- Agricultural sprays and fertilizers

### **How Do Air Pollutants Affect Us?**

Air pollution can make people sick, make things dirty, damage buildings and our ecosystem, change the weather, make holes in the atmosphere and mix with clouds to form poisonous acid rain.

Air pollutants may cause a variety of adverse human health effects. They can cause rashes, eye/nose irritation, headaches, fatigue, shortness of breath, coughing, sneezing and dizziness. Air pollutants can also cause more serious problems such as cancer, asthma, kidney failure, liver damage and birth defects. The degree of the health effects depends on the magnitude and frequency of exposure to the pollutants.

The water cycle usually cleans the air of pollutants naturally. Currently, however, there are two problems with this: the water cycle is unable to clean contaminants as quickly as they are added, and high concentrations of pollutants contribute to acid rain.

### **What are the pollutant solutions?**

How do we get people to keep the air clean? Some governments have introduced strict legislation to control the number of by-products released by industrial companies and modes of transportation.

But we don't just have to rely on the government for a solution. We can all do our bit to make a difference. For example, we can reduce fuel use by joining a car pool, taking the bus/train, riding a bike or walking. In general, reducing energy use, (especially in our homes), can be an important contribution to improving air quality. Also, some people choose to buy and use more environmentally-friendly products such as non-aerosol products and non-toxic cleaners.

### **Did you know that plants give us better air quality?**

Even though plants make oxygen, which is essential to live, people have destroyed almost two-thirds of the original forests on Earth.

Reference:

[https://www.teachengineering.org/view\\_lesson.php?url=collection/cub\\_/lessons/cub\\_air/cub\\_air\\_lesson01.xml](https://www.teachengineering.org/view_lesson.php?url=collection/cub_/lessons/cub_air/cub_air_lesson01.xml)

### **Activity**

Choose a city where air pollution is a major problem. Present your ideas on how to improve the air quality of that city.

## Unit 9 : Sleep

### Teenagers and sleep deprivation

Sleep deprivation in teens is on the rise. The number of extra activities children are taking part in these days has created many sleepy teenagers, along with the early start of school.

Sleep deprivation in teens is a major area for concern because we know that during those years, a teenager requires more sleep than during the preteen years. But studies show that teens actually get much less sleep than they did during those preteen years.

### Symptoms of Sleep Deprivation in Teens, & the Effect of Sleep Deprivation on Teens:

- Feels sleepy during the daytime
- Has trouble staying awake in school
- Has trouble getting out of bed in the morning
- Experiences fatigue
- Experiences emotional problems
- Is often irritable
- Has poor impulse control
- Makes poor decisions

What causes sleep deprivation in teens? Lifestyle can play a role, but some of it is biological as well. Recent studies have shown that the body's internal, biologic sleep-timing mechanism is reset during puberty. A teen's body signals them to go to sleep at a later hour and also to sleep later in the morning. They are often not able to fall asleep earlier. But their school schedules continue to force them out of bed at an early hour.

## Activities:

1. What advantages can you see for starting school later at secondary level?
2. What would be some disadvantages?
3. Which of the above symptoms of sleep deprivation could lead to car accidents?
4. Sleep deprivation in teenagers was the focus of a study released by the National Centre on Sleep Disorders Research in the U.S.A. This research found that teenagers who had four or more 'mentally stimulating devices' such as mobile phones, televisions and computers in their bedrooms, had a twofold chance of falling asleep in class.  
<https://www.nhlbi.nih.gov/about/org/ncsdr/>

Can the use of technology such as mobile phones, TVs, computers and iPods in bedrooms can cause sleep deprivation? Give reasons.

5. What else can be a cause of being unable to fall asleep?
6. The ability to fall asleep at night requires a state of relaxation. How can this be achieved?
7. While we are awake, we are using energy stores, vitamins and minerals. Why do you think sleep deprivation has a negative effect on health?
8. Teenagers and adults need 9 hours of sleep per night. Estimate your average sleeping time per night.
9. What do these verses tell us about sleep? Use your own words.

Psalm 127: 2

Psalm 91: 1-5

Proverbs 3:24

## Helpful tips for a good night's sleep

- Establish a regular, relaxing routine to unwind from the activities of the day. This gives the body the signal that it is time to fall asleep. Listening to relaxing worship music or instrumental music may be something you could try. This may also be the time to read the Bible or a daily devotion.
- Try to go to bed at the same time each night. Ideally this should be between 10 and 11 p.m.
- Don't read books, watch TV programs or play computer games that are violent, frightening or very mentally stimulating just before sleep.
- Don't have stimulating conversations on your phone close to bedtime.
- Don't drink caffeine in the afternoon or evening.
- Undertake regular exercise.
- Don't sleep during the day.
- Eat a healthy diet, and take a vitamin B complex supplement each morning if you are feeling stressed. Nervous energy uses up vitamin B. Lack of vitamin B creates additional stress. (Don't take vitamin supplements before bed. They may give you energy!)

### Activity

Using the information in this unit, make some recommendations to yourself for improving your sleep routine.



# TEST - Sleep

## True or false

1. Playing computer games just before going to bed may interfere with sleep.
2. Regular exercise can help reduce stress.
3. Sleeping during the day is a good idea if you can't sleep at night.
4. Sleep deprivation can cause health problems.
5. Sleep deprivation can cause accidents.

## Answer with a single word:

6. To fall asleep at night we need to feel \_\_\_\_\_
7. Teenagers and adults need at least \_\_\_\_\_ hours of sleep per night.
8. A good time to go to bed is no later than \_\_\_\_\_ pm.

## Score:

## Unit 10: Enjoyment

The final letter of the New Start acronym is “T” for “Think happy thoughts”. Although we can’t always be enjoying ourselves, it is important that we allow time in our week to relax and enjoy yourself.

This might seem difficult when you are running the mental marathon in preparation for final exams. But if you take a little time off for pleasure you will be refreshed and regenerated, with a better performance outcome.

Stress is a major cause of illness. Stress may not be caused by a specific event, but may be a result of the cumulative impact of our environment upon our lives. Although most of us are aware of the importance of adequate rest, recreation, exercise and good diet, the busyness of life can often crowd out the things of most importance, like spending time with family and friends.

As well as allowing time for enjoyment it is important to have a positive outlook on life. There will always be events and obstacles in life that can cause us to worry or feel glum.

Teenage years are full of hurdles. Do you worry about how you measure up to your peers? About your body image? About the future?

Trusting in God to take care of our worries is the best answer. 1 Peter 5<sup>7</sup> says, “Cast all your anxiety upon Him, for He cares for you.”

*How do we trust and put worry aside?*

The first step is to become quite clear about God's path for your life. Psalm 31:15 says, "My times are in Your hands".

Believe that God has a great purpose for your life, even if the way ahead is cloudy now. Set time aside for rest, recreation and worship of God. This will do wonders for our health and well-being. A complete change from the daily work routine once a week is a biblical principle. As we seek first God and His kingdom, then time for the most important things in life will be added to us. (*Matthew 6:33*)

### Activities

1. Make a list of the things you would like to do for recreation and enjoyment if you had the time.
2. Decide how much time you can spend on these things in addition to allowing the appropriate amount of time for studies.
3. Now make a plan for implementing these activities in your week.

## Laughter is the best medicine

*Laughter is strong medicine for mind and body*

- Laughter is a powerful antidote to stress, pain, and conflict.
- Laughter relaxes the whole body.
- Laughter boosts the immune system. Laughter decreases stress, increases immune cells and infection-fighting antibodies, thus improving your resistance to disease.
- Laughter triggers the release of endorphins, the body's natural feel-good chemicals. Endorphins promote an overall sense of well-being and can even temporarily relieve pain.
- Laughter protects the heart. Laughter improves the function of blood vessels and increases blood flow, which can help protect you against a heart attack and other cardiovascular problems.
- Laughter dissolves distressing emotions. You can't feel anxious, angry, or sad when you're laughing.
- Laughter helps you relax and recharge. It reduces stress and increases energy, enabling you to stay focused and accomplish more.
- Humor shifts perspective, allowing you to see situations in a more realistic, less threatening light.
- Humor strengthens our relationships with others by triggering positive feelings and fostering emotional connection.
- Humor helps us to let go of defensiveness. Laughter helps you forget judgments, criticisms, and doubts.

*Here are some ways to start putting more laughter in your life:*

1. Smile. Smiling is the beginning of laughter. Like laughter, it's contagious. When you look at someone or see something even mildly pleasing, practice smiling.
2. Count your blessings. Literally make a list. When you think of all the good things in your life you will not focus so much on negative thoughts that prevent you from feeling happy.
3. Spend time with happy people. These are people who laugh easily. They laugh at themselves and easily find opportunities to laugh.
4. Bring humor into conversations. Tell people about the funniest thing that happened to you today or this week.

Reference: <http://www.helpguide.org/articles/emotional-health/laughter-is-the-best-medicine.htm>

### Activities

1. Write about a funny thing that has happened to you or your family.
2. There are some situations when it would be inappropriate to laugh. Give two examples.