Unit 1: Getting the right balance

1A. The History of Food

The first people on earth hunted and gathered whatever food they could find around them, but as time went on people became more proficient at farming crops and animals. They did not use pesticides or fertilizers. They rotated their crops so as not to exhaust the soil of its nutrients. They would allow sections of land to lay fallow for a period of time, giving the soil a chance to recuperate after the pervious crop. Plant crops were very nutritious because the soils were full of nutrients. Animal foods were also nutritious because they ate the nutritious plants. The food chain was free of chemicals and pesticides.

The Industrial Revolution in Europe saw the introduction of machines. Grains that were once harvested and ground by hand could now be processed many times faster by machinery. 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.

While artificial fertilizers provide enough nutrients to make the plants grow well, they do not provide as many nutrients as the old fashioned methods of composting and manuring. Other chemicals added to food are preservatives, flavour enhancers and colourings.

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).

What is added to processed food to make the food last longer or to make more sales?

_____

Make a list of foods you know that have these additives.

_____

_____

On a separate sheet of paper draw a timeline to show the history of food from hunters and gatherers to present day. Use diagrams and brief statements to describe the state of food at various points in time: e.g. hunters and gatherers, farming with crop rotation, Industrial Revolution, World War 2, Post War to present day. Use books or the internet to find out dates for some of these events.

1B. Good fats bad fats

People in early 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 health 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 omega 6 is found in seeds, avocadoes, olives and nuts. (Peanuts are not included in this list because peanuts a not really a nut. They are a legume).These oils provide the best fats and they encourage 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 omega 3. We need omega 3 for protection of our heart and brain. An overbalance of omega 6 can take away that protection and can also cause obesity.

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 omega 3 and omega 6 to function properly. Omega 3 and 6 are good fats. Saturated fats from animals are called lard, and are not a good fat. It is saturated and slows us down. Butter and cheese, also from animals, can be beneficial in small amounts because they help us absorb the fat soluble vitamins A,D, E and K. Coconut oil, which is a plant saturated fat, is a good fat. It helps us burn all the fats we consume and provides protection for our cells. Transfats are the worst fats. These are the overheated vegetable oil found in processed fried foods, pastries and margarine. They do not provide good fuel for the brain. They can contribute to diseases like heart disease and cancer.

1. Which food contains omega 3 oil?

_____

2. Which foods contain omega 6 oil?

_____

3. Omega 3 and omega 6 are good oils. Why?

_____

4. Where does lard come from? What does it do to our cells?

_____

5. Name a good source of saturated fat.

_____

6. List some sources of transfats.

_____

7. Why should we avoid transfats?

_____

8. Tick the good fat sources from the following list:

- ☐ Coconut oil
- ☐ Butter used sparingly
- ☐ Corn oil
- ☐ Canola oil
- ☐ Olive oil
- ☐ Almonds
- ☐ Cashews
- ☐ Avocadoes
- ☐ Sesame seeds
- ☐ Sunflower seeds
- ☐ Peanuts
- ☐ Fish
- ☐ Margarine

A note about fish:
While fish is a good source of Omega 3, much fish today is contaminated with heavy metals like mercury. These pollutants come from factory waste that finds its way into the ocean. One of the safest sources of fish at present is wild Alaskan salmon because it is caught in unpolluted waters. You can find this in tins in the supermarket. Other big fish like tuna, shark and swordfish are not so safe to eat because they are at the top of the food chain and accumulate significant levels of mercury. Little fish like sardines are low on the food chain so they are less contaminated.

Answers to no.8
Coconut oil, butter used sparingly, olive oil – cold pressed, almonds, cashews, avocadoes, sunflower seeds, fish

1C. Protein for strength

Animal foods and certain plant foods provide our bodies with 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, milk, yoghurt
Plant sources:
Legumes – (which include lentils and dried peas and beans), nuts and seeds

Make a list of the protein foods you eat.

Meat today is not as good for us as meat eaten years ago. Animals on the run get exercise and do not build up saturated fat in their bodies. Animals that do not get exercise give poorer quality meat – less nutrients and more fat. 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.

Too much meat can be hard for our bodies to process and can make those little engines in our cells overwork. 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, take 100 away from your height in cm.

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

If you are 170 cm tall, you need 70 grams per day. But you need more if you are doing strenuous exercise. Make sure that you include some plant proteins and eggs in the daily protein requirement. This is better for your health than just eating meat for protein.

Which meats are the best meats? Choose lean meats – less fat. Choose meats that you cook for yourself and not already cooked. Processed meats like salami, frankfurters, ham and bacon contain food additives called nitrates - (food numbers 249, 250, 251, and 252). These are chemicals may be bad for our health. Another additive to avoid is MSG (monosodium glutamate). This is a flavour enhancer found in some take-away foods, including some Chinese food and some processed, supermarket foods like savoury 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 is commonly thought to be a good source of calcium and protein. (Calcium is a mineral needed for bone strength). When milk is pasteurized, the enzymes are destroyed, so it is no longer easy to digest. There may be a lot of calcium in milk but our bodies can’t absorb much of it, so it is best to look at getting calcium in other forms, like green leafy vegetables.

Milk may be a problem when it comes to weight gain. The homogenizing of milk disperses the fat content into tiny globules throughout the milk making the fat easy for our bodies to absorb. If you do not want to put on weight then low-fat milk is better. There are some good alternatives to cow's milk available in the supermarket. Goat milk or calcium-enriched rice milk are good options. Cow's milk is associated with food intolerances and allergies. If you have problems with runny noses, asthma and eczema, then cow's milk is the number-one food to cut out of the diet.

Natural yoghurt on the other hand is a beneficial food because it is a good source of protein and aids digestion. It has beneficial bacteria, acidophilus and bifidus. These help break down the normally indigestible part of milk. Most flavoured 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.

Cheese is another source of protein. The better cheeses are the softer, more digestible cheeses: like cottage, ricotta, brie, camembert and feta. These are cultured and are closer to yoghurt.

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 flavours of curry, chilli, or tomato and garlic, (if you don't like things too spicy), make these dishes delicious. Try some of the recipes from the *Recipe Section*.

Choose some healthy proteins to include at each meal:
Breakfast: _____

Lunch: _____

Dinner: _____

Why is it important to get enough protein?

_____

What happens when we get too much protein?

_____

Which is the best kind of meat to eat?

_____

What is your recommended daily intake of protein? _____

What are some of the problems associated with regular homogenized cow's milk?

_____

What are some good alternatives?

_____

What are some benefits of natural yoghurt?

_____

Name and describe a traditional dish from India, Mexico or the Middle East that uses legumes for one of the principle ingredients.

_____

The Food analysis chart

Food	Amount	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	1 cup (cooked)	240	12	54	1
Fish-salmon	1 piece (grilled)	85	22	0	4

Recommended Daily Allowance of protein for teenagers:
Males 15-18 years old – 59 g.
Females 15-18 years old – 44 g.

Make a list of protein foods that would give you your Recommended Daily Allowance.
Remember the formula – height minus 100.

1D. The Carbs

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 or anything made from flour, rice, sugar or anything made from sugar.

When we exercise, our cells (little engines really), 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 too much. 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, chips and sweets.

Complex carbohydrates on the other hand are good carbs. These are the unrefined foods like brown rice, rolled oats and whole grains. Sweet potatoes are full of goodness, and less starchy than white potatoes. Legumes, (lentils, dried peas and beans), are also 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 fibre 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.

What is the function of carbohydrates?

_____

List some refined carbohydrates.

_____

What are some of the disadvantages of refined carbohydrates?

_____

List some complex carbohydrates.

_____

What are some of the advantages of complex carbohydrates?

_____

_____

List some complex carbohydrates that could be eaten at the following meals:

Breakfast: _____

Lunch: _____

Dinner: _____

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

_____

_____

1E. Vegetables and Fruit

Vegetables and fruits are like medicine, but good tasting medicine. In *The Lion, the Witch and the Wardrobe*, 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 colour coded. Different colours 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 colours 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 carbohydrate. 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 faeces, 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 does not digest very well following a heavy meal.

1. Look at the Healthy Food Pie and estimate the percentage of coloured 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?

_____

_____

_____

6. When is the best time to eat fruit?

_____

7. Why are raw vegetables important?

_____

8. Why are green leafy important?

_____

_____

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