

Year 12

Level 3 Certificate/Diploma in Food Science and Nutrition

Summer independent study

- Complete the summer independent study work below
 - Tick off when each activity is complete
 - Take photos as evidence when making the practical dishes
 - Bring your completed booklet to your first lesson in September
- Alternatively, email your completed booklet to
kerry.masterman@rugbyfreesecondary.co.uk

Task	Activity	Complete?
1	Understanding the importance of the Eatwell Guide	
2	How to make fruit crumble	
3	Understanding the function of macronutrients	
4	How to make fruit/savoury scones	
5	Understanding the function of vitamins	
6	How to make chicken curry	
7	Understanding the function of minerals	
8	How to make pasta bake	

Name:

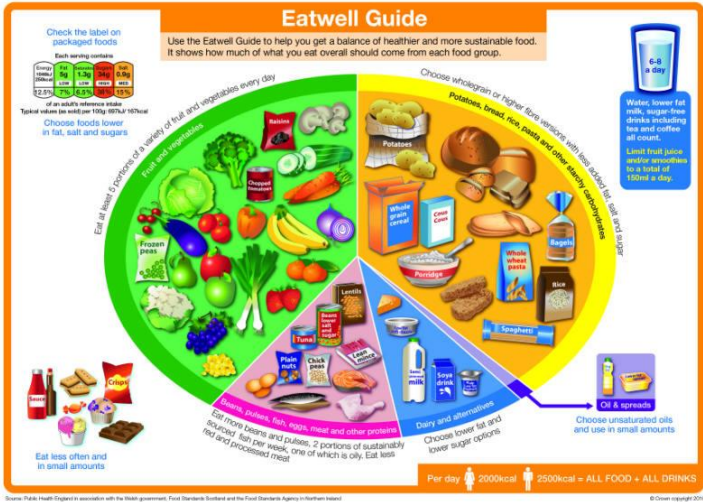
Useful websites:

<https://www.nhs.uk/live-well/eat-well/the-eatwell-guide/>
<https://www.gov.uk/government/publications/the-eatwell-guide>

The Eatwell Guide shows how much of what we eat overall should come from each food group to achieve a healthy, balanced diet.

You do not need to achieve this balance with every meal, but try to get the balance right over a day or even a week.

Task (1) Do some further research and find out:



What does each section represent in terms of percentages? The first one has been done for you.

Section	Percentage
Fruit and vegetables	40%
Starchy carbohydrates	
Proteins	
Dairy and alternatives	
Oils and spreads	

When did the Eatwell plate change and become the Eatwell Guide, which we use today?

Who is the Eatwell Guide not suitable for?

Learning: How to make fruit crumble

Fruit crumble (serves 4 - 6)

What do I need?

Ingredients	Equipment
150g of plain or wholemeal flour 75g of margarine 100g of caster sugar 2 large cooking apples	Mixing bowl Ovenproof dish Sharp knife Peeler Chopping board

How do I make it?



1. Preheat the oven to Gas mark 4/180°C.



6. Cover the bottom of your dish with the sliced apples.



2. Put the flour into a mixing bowl and rub in the margarine.



7. Sprinkle on the rest of the sugar and cover the apples with the crumble mixture.



3. When the mixture looks like breadcrumbs, add half of your sugar and stir well.



8. Cook in the oven for 20 minutes.



4. Wash and peel the apples. Slice thinly.



Task (3)

Unit (1) LO2 Understanding properties of Nutrients

Learning: Understanding the function of macronutrients

Task (3): Read the information below. Then answer the questions on the next page.

Carbohydrates

Function: • Gives the body energy • Gets rid of waste products in the body	Source: Two groups of carbohydrates: • Sugars (<i>fruit, vegetables, sugar, milk</i>) • Complex carbohydrates (<i>starchy foods such as pasta, bread, cereals, potatoes</i>)	Deficiency: • Lack of energy • Weight loss • Severe weakness	Excess: • Converted into fat and stored in the body. • An increase in weight increases the risk of developing diet-related illnesses such as obesity, diabetes, coronary heart disease (CHD).
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Protein

Function: • To make the body grow • To repair the body • To give the body energy	Source: • Meat, poultry, fish, dairy, eggs, beans and lentils, quinoa, soya beans. • Meat alternatives such as 'Quorn', TVP and tofu.	Deficiency: • Children will not grow properly • They may lose some of their hair • Skin and nails will be in poor condition • Easily develop infections	Excess • Protein contains nitrogen. Too much nitrogen in the body is dangerous. • The liver and kidneys have to work harder to get rid of the nitrogen. This puts them under stress and could cause them to be harmed.
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Amino acids = the 'building blocks' that join together to make protein molecules.	Essential amino acids = amino acids that the body cannot make by itself and must get ready-made from food.	High biological value protein (HBV) = Protein foods that contain all of the essential amino acids.	Low biological value protein (LBV) = Protein foods that are missing one or more of the essential amino acids	Protein complementation = Eating a mixture of LBV proteins together, can provide you with all the amino acids that you need. This is important for vegetarians and vegans.
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Fat

Function: • To provide a store of energy • To insulate the body • To protect bones and organs • To give the body fat-soluble vitamins A, D, E and K	Source: • Animal fats (<i>butter, lard, goose fat, meat, meat products e.g. sausages. Oily fish, cheese, and eggs</i>) • Vegetable sources (<i>vegetable and plant oils e.g. olive, sunflower, rapeseed. Avocados, nuts, seeds and fat spreads</i>)	Deficiency: • Body weight can be lost if carbohydrate intake is reduced • The body will chill quickly • The body will bruise easily and the bones will hurt • The body will not receive enough vitamins A, D, E or K	Excess: • Can be stored in the body if not burned off and can lead to obesity. • An increase in weight increases the risk of developing diet-related illnesses such as obesity, diabetes, coronary heart disease (CHD).
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Task (3)

Unit (1) LO2 Understanding properties of Nutrients

Learning: Understanding the function of macronutrients

What are the main functions of protein?

What is the difference between high and low biological value protein?

What is protein complementation and who should do it?

What happens if the body has too much fat?

What happens if the body doesn't have enough carbohydrates?

What are amino acids?

Scones (serves 4 - 6)

What do I need?

Ingredients	Equipment
200g self raising flour 50g butter or margarine 1 egg 125ml of milk 75g of dried fruit or grated cheese 1 teaspoon of dried herbs or spices	Mixing bowl Baking tray Measuring jug Fork Table knife Pastry brush Wooden spoon

How do I make it?



1. Preheat the oven to Gas mark 6/200°C. Grease a baking tray.



2. Sieve the flour into a large mixing bowl.
3. Rub in the butter/margarine using your fingertips. Stir in the fruit or other ingredients.



4. Crack the egg into a measuring jug. Add the milk and whisk with a fork.



5. Gradually stir in the egg and milk into the flour mixture (you won't need all of it - save a little of the mixture to glaze the scones).



6. Stir with a table knife until the mixture comes together. You may need to use your hands to gather the dough into a ball.
7. Sprinkle some flour onto your work surface. Lightly pat the dough until it is about 2cm in thickness.
8. Use a pastry cutter to cut out circles and place on a greased baking tray.
9. Re-roll the remaining dough to make more scones.
10. Brush tops with any remaining egg and milk mixture.
11. Bake in the oven for 12-15 minutes until golden brown and risen.



Task (5)

Unit (1) LO2 Understanding properties of Nutrients

Learning: Understanding the function of vitamins

Task (5): Read the information below. Then answer the questions on the next page.

Fat-soluble vitamins (found in foods containing fat, stored in the liver)

Vitamin A (chemical name: Retinol and beta-carotene)**Function:**

- Healthy skin
- Helping vision in dim light
- Protecting the body; it is an antioxidant
- Growth and development of the body

Source:

There are 2 types of vitamin A. They are called **retinol** and **beta-carotene**.

- Retinol is from animal sources e.g. eggs, oily fish, liver, full fat milk, butter, cheese, margarine.
- Beta-carotene is from vegetable sources e.g. yellow, red and green leafy vegetables, such as spinach. Yellow fruit such as mangos and apricots.

Deficiency:

- The deficiency of vitamin A is called night blindness.
- Night blindness is the failure to see well in dim light. If not treated, it can lead to blindness.

Excess:

- Retinol can be poisonous if eaten in large amounts.
- Pregnant women should avoid eating large amounts of foods containing vitamin A because it may harm their developing baby.

Vitamin D (chemical name: Cholecalciferol)**Function:**

- Developing and maintaining bones and teeth.
- Preventing bone diseases such as rickets and osteoporosis.
- Helping the body to absorb calcium.

Source:

- The main source of vitamin D is sunlight. Vitamin D is often called the sunshine vitamin.
- Good sources of vitamin D are: milk, butter, liver, oily fish and eggs.

Deficiency:

- Not enough vitamin D can result in rickets in babies and toddlers.
- Growing bones require vitamin D to harden. Without vitamin D, they will soften and this will cause them to bend and bow.

Excess

- An excess is rare, but if too much vitamin D is taken, it will lead to excess calcium being absorbed, which could lead to damage to the kidneys and other organs, especially in babies and young children.

Vitamin E (chemical name: Tocopherol)**Function:**

- Protecting the body; it is an antioxidant.

Source:

Olive oil, sunflower oil, egg yolk, nuts, cereals and cereal products, soya, and seeds.

Deficiency:

- A deficiency of vitamin E is rare.

Excess

- Excess vitamin E is stored in the body for future use.

Vitamin K (chemical name: Phylloquinone)**Function:**

- Making blood clot.
- Maintaining bone health.

Source:

- Green leafy vegetables, liver, cheese, green tea (also made in the large intestine by bacteria).

Deficiency:

- A deficiency is rare, as vitamin K is made by the body.
- Signs of a deficiency include easy bruising and bleeding.

Excess

- Excess vitamin K is stored in the body for future use.

Task (5)

Unit (1) LO2 Understanding properties of Nutrients

Learning: Understanding the function of macronutrients

What are the two types of vitamin A and where are they found?

What is night blindness and what vitamin is it linked to?

What is the chemical name for vitamin E?

Vitamin A and E are antioxidants. What does this mean?

What can happen if you have a deficiency in vitamin D?

What is the function of vitamin K?

Learning: How to make chicken curry

Chicken curry (serves 2)

What do I need?

Ingredients	Equipment
1 tablespoon of vegetable oil for frying 1 onion, chopped 2 tablespoons of curry paste (madras) 4 tomatoes, chopped 2 chicken fillets 100g of young spinach 4 tablespoons of plain yogurt A handful of coriander	Saucepan Wooden spoon Sharp knife Chopping board
Optional You could use pork, beef, prawns, Quorn or vegetables instead of chicken.	

How do I make it?



1. Heat the vegetable oil in a saucepan or frying pan and add the chopped onion.



2. Fry for about 3 minutes until soft then stir in the curry paste and fry for a minute.



3. Add the chicken and tomatoes and a splash of water and cook for 15-20 minutes until cooked through.



4. Stir in the spinach until it just wilts then stir in the yoghurt and coriander. Season with salt and pepper.



5. Serve with rice and/or naan bread.



Task (7)

Unit (1) LO2 Understanding properties of Nutrients

Learning: Understanding the function of minerals

Task (7): Read the information below. Then answer the questions on the next page.

Minerals (chemical substances naturally found in plant and animal foods)

Calcium**Function:**

- Helps to build strong bones and teeth.
- Controlling muscle contractions including the heartbeat.
- Ensuring that the blood clots normally.

Source:

- Bread and fortified cereals (added by the manufacturer), milk, green leafy vegetables, fish with softened bones (e.g. canned fish).

Deficiency:

- A lack of calcium could lead to a condition called **rickets** in children or **osteoporosis** in adults.

Excess:

- This is rare. If too much calcium is absorbed into the body (perhaps because of too much vitamin D), some of it will be deposited in organs such as the kidneys which will stop them working.

Iron**Function:**

- Making red blood cells, which carry oxygen around the body.
- Vitamin C is required to enable iron to be absorbed from food during digestion.

Source:

- Red meat, kidney, liver, wholemeal bread, green leafy vegetables (spinach, watercress, cabbage), fortified breakfast cereals (added by the manufacturer), dried apricots, egg yolk.

Deficiency:

- A shortage of iron in the diet is a very common nutritional problem. A lack of iron is called **iron deficiency anaemia**.

The symptoms are:

- Tiredness
- Dizziness
- Shortness of breath during exercise
- A pale appearance
- Brittle nails and cracked lips.

Excess

- Too much iron is poisonous to the body and could happen if someone takes too many supplements.

Sodium (salt)**Function:**

- Keeps the level of water in the body balanced.
- Helps to control nerves and muscles.

Source:

- Salt is added to many processed foods, and can also be added to nuts, smoked fish, bread, cheese, bacon.

Deficiency:

- Low intakes of sodium result in muscle cramps.
- This can be bought on by losing salt in sweat in hot climates or by sickness and diarrhoea.

Excess

- Too much sodium can cause high blood pressure.
- This can put a strain on the heart and kidneys, which will affect how efficiently they work.

Task (7)

Unit (1) LO2 Understanding properties of Nutrients

Learning: Understanding the function of minerals

What are the main functions of calcium?

What happens if you don't have enough iron?

What is sodium also known as?

What can happen if you have too much sodium?

What is rickets?

What are minerals?

Tuna pasta bake (serves 4)

What do I need?

Ingredients	Equipment
400g of cooked pasta 50g of butter 50g of plain flour 600ml milk 250g of mature cheddar, grated 2 x 160g cans of tuna, drained 330g can sweetcorn, drained Optional Large handful chopped parsley	Saucepan Wooden spoon Sharp knife Chopping board Grater Ovenproof dish Tin opener

How do I make it?



1. Preheat the oven to 180°C/gas mark 4.
2. To make the white sauce, melt the butter in a saucepan and stir in the flour.



3. Cook for 1 min, then gradually stir in the milk, a bit at a time, to make a thick white sauce.



4. Remove from the heat and stir in all but a handful of cheese.



5. Mix the cooked pasta with the white sauce, tuna, sweetcorn and parsley, then season.



6. Transfer to a baking dish and top with the rest of the grated cheese.



7. Bake for 15-20 mins until the cheese on top is golden and starting to brown.