



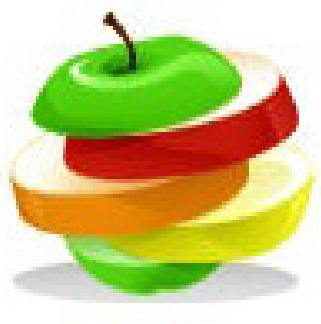
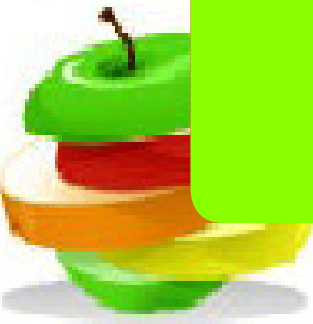
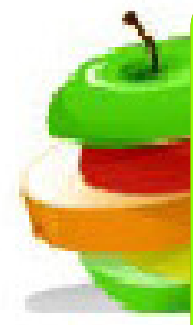
Food Preparation and Nutrition GCSE

Investigating Nutrition using

the Nutrition Program

Finding sources and functions

of macro and micronutrients





Food Preparation and Nutrition GCSE

Food, Nutrition and Health

- This pack shows how the Nutrition Program can develop knowledge and understanding of the section Food, Nutrition and Health in the GCSE.
- It is just a taster - a larger, downloadable pack is available for Nutrition Program users.
- The Nutrition Program has hidden sections of information and I've created step by step worksheets for students to answer in an investigative way.



Food teaching in the future is going to be interesting! Jenny Ridgwell

Food, Nutrition and Health section of GCSE - Macronutrients		
To know and understand	Extra things	Application
Protein - functions, main sources, related DRVs.	Look at protein alternatives - textured vegetable protein (TVP), soya, mycoprotein, tofu. Animal and vegetable sources.	Modify protein in recipes for vegetarian diets.
Fats - functions, main sources, related DRVs.	Saturated fats and unsaturated fats.	Modify a recipe to reduce fat.
Carbohydrates - functions, main sources, related DRVs.	Include starch, sugar and dietary fibre.	Modify a recipe to increase fibre.
Food, Nutrition and Health section of GCSE- Micronutrients		
To know and understand	Extra things	Application
Fat soluble vitamins - functions, main sources, related DRVs.	To include vitamin A, D, K.	Preparing fish to make a dish high in vitamin A and D.
Water soluble vitamins - functions, main sources, related DRVs.	To include B group - thiamin (B1), riboflavin (B2), folic acid, B12. Vitamin C (ascorbic acid).	Investigate how to cook vegetables to reduce loss of water soluble vitamins when cooking vitamins B and C.
Calcium - functions, main sources, related DRVs.		Prepare milk/cheese dish high in calcium.
Iron - functions, main sources, related DRVs.		Prepare dish high in iron - meat, liver, vegetables high in iron.
Salt/sodium - functions, main sources, related DRVs.		Look at reducing salt content in dishes.
Water - functions in the diet.		Make some nutritious soup.

Protein



Statement from specification - *The macronutrients*

Protein – functions and deficiency, animal and vegetable sources.

The Task

- In the Nutrition Program choose My Recipes and + New Recipe - call it Protein. Find some good animal and vegetable sources and the function of protein.
- In Find Ingredient, click Show and change to Food High in Protein.
- You see a list of ingredients which are high in protein.
- Scroll down and choose 3 *animal foods* high in protein and which are useful cooking ingredients. For example - cheese from milk, is an animal product. Choose 3 *vegetable foods* high in protein and which are useful cooking ingredients. For example - nuts.

Ingredient	g/100g
leaf gelatine	86
gelatine	84
gelatine sheet	84
Whey Protein	76

	Main ingredients high in Protein	Protein grams/100g
Animal foods	1.	
	2.	
	3.	
Vegetable foods	1.	
	2.	
	3.	

Now use the Nutrition Program to find the function of protein.

Put 100 grams of one food choice into My Recipes.

Click Nutrition and hover over the word Protein with your mouse.

The function of protein is:

.....

.....

.....

Nutrition	Per 100g	Per 100g portion
Energy	1708 kJ	1708 kJ
Energy	412 kcal	412 kcal
Protein		
Carbohydrate		
Fat	34 g	34 g

Cook with protein



Plan a meal with a protein main course and a dessert.

Input the recipe into the Nutrition Program and see the result.

Which food is the main source of protein?

Change the protein food for another choice.

Test the recipe and see if it works.

Take a traditional recipe such as Spaghetti Bolognese and remove the meat and replace it with tofu or TVP (Textured Vegetable Protein), mycoprotein (Quorn) or lentils. Test out the recipe to see if it tastes OK and look at the changes in the nutrition.

Fat



Statement from specification - *the macronutrients*

Fats – fats and oils, saturated, unsaturated, polyunsaturated.

Sources, functions and deficiency.

The Task

- In the Nutrition Program choose My Recipes and + New Recipe - call it Fats. Now find some sources of fats and oils and the function of fats.
- In Find Ingredient, click Show and change to Food High in Fat.
- You see a list of ingredients which are high in fat.
- Choose 3 oils and 3 fats for the chart.

Fats

Find Ingredient

Show:

Food high in Fat

Ingredient	g/100g	
oil, almond	100	+
oil, rice bran	100	+
oil, mustard	100	+
hemp seed oil	100	+

	Main ingredients high in fat	Fat grams/100g
Oils	1.	
	2.	
	3.	
Fats	1.	
	2.	
	3.	

Now use the Nutrition Program to find the function of fat.

Put 100 grams of one food choice into My Recipes.

Click Nutrition and hover over the word Fat with your mouse.

The function of fat is:

.....

.....

.....

Fats

Show 4 Show 8 Show

Nutrition	Per 100g	Per 100g portion	RI (worst)
Energy	3079 kJ	3079 kJ	37%
Energy	749 kcal	749 kcal	37%
Protein	1.0 g	1.0 g	2%
Carbohydrate	0.8 g	0.8 g	0%
Fat	82 g	82 g	118%

Traffic Light

Green - a healthy choice

Fat - good source of energy and supplies essential fatty acids that the body can't make.
Amount in recipe: 82 g per 100g butter (100%)



Cook lower fat dishes

Choose a recipe that you think is high in fat. It could be a pastry quiche or pasta dish made with cream and cheese.

Enter the recipe into My Recipes.

Now make a healthier version by changing some of the ingredients.

- Increase the vegetable content.
- Lower the amount of high fat ingredients.

Fat



Statement from specification - *the macronutrients*
Fats – fats and oils, saturated – sources, functions.

The Task

To find foods in the Nutrition Program which contain saturated fats.

- In Find Ingredient, click Show and change to Food High in Saturated fat.
- You see a list of ingredients which are high in saturated fat.

Fats

Find Ingredient

Show:

Food high in Saturated fat

Ingredient	g/100g	
oil, coconut	87	+
butter, ghee	66	+
butter, goats, slightly salted	60	+
coconut, creamed	59	+

Main ingredients high in saturated fat	Saturated fat grams/100g
1.	
2.	
3.	

Now use the Nutrition Program to find the function of saturated fat, mono unsaturated fat, polyunsaturated fat.
 Put 100 grams of butter into My Recipes.

Click Nutrition/ Show All and hover over saturated fat, mono unsaturates, and polyunsaturates with your mouse.

1. The function of saturated fat is:

.....

.....

.....

2. The function of mono unsaturated fat is:

.....

.....

.....

3. The function of polyunsaturated fat is:

.....

.....

Fat	82 g	82 g
Saturated Fat	53 g	53 g
Mono Unsatu	Too much saturated fat can increase the cholesterol in the blood. Amount in recipe: 53 g per 100g butter (100%)	
Polyunsaturat		
Trans Fatty Acids*	0.0 g	0.0 g
Cholesterol*	0.0 mg	0.0 mg



Cook to lower the saturated fat
 Choose a recipe that you think is high in saturated fat. It could be made with butter, cream or processed meats.

Enter the recipe into My Recipes.

Now make a healthier version by changing some of the ingredients.

- Increase the vegetable content.
- Replace the ingredients high in saturated fats.

Carbohydrate



Statement from specification - *the macronutrients*

Carbohydrates – types and functions – sugar, starch and fibre.

The Task

To find foods in the Nutrition Program which contain carbohydrates.

- In the Nutrition Program choose My Recipes and + New Recipe - call it Carbohydrate.
- Find some sources of carbohydrate and the function of sugars, starch and fibre.
- In Find Ingredient, click Show and change to Food High in Carbohydrate.
- You see a list of ingredients which are high in carbohydrates.

Carbohydrate

Find Ingredient

Show:

Food high in Carbohydrate

Ingredient	g/100g	
sugar	105	+
caster sugar white	105	+
icing sugar	105	+
Demerara sugar	105	+

Main ingredients high in carbohydrate	Carbohydrate grams/100g
1.	
2.	
3.	

You will notice that all the sugary foods are the highest in carbohydrate.

Scroll down and find foods which are not sugars (sucrose) and make a new list.

Examples of cooking ingredients high in carbohydrate - not sugar ingredients	Carbohydrate grams/100g
1.	
2.	
3.	

Now use the Nutrition Program to find the function of carbohydrate.

Put 100 grams of wholemeal bread into My Recipes. Click Nutrition and hover over Carbohydrate.

The function of carbohydrate is:

.....

.....



Cook with carbohydrate

Create a savoury or sweet dish with plenty of starch and fibre - use lots of vegetables!

Add other vegetables to go with it.

Put it into My Meals and see how you have done.

Make some changes.

- Ideas for adding starch - potatoes, couscous, pasta, quinoa...
- Ideas for adding fibre - add lentils, carrots, celery ..

Sugar and fibre



Statement from specification - *the macronutrients*

Carbohydrates – types and functions – sugar, starch and fibre.

The Task

1. To find foods in the Nutrition Program which contain sugars.

- In the Nutrition Program choose My Recipes and +New Recipe - call it Sugars. Now find some sources of sugar and the function of sugars.
- In Find Ingredient, click Show and change to Food High in Total Sugar.

Carbohydrate

Find Ingredient

Show:

Food high in Total sugars

Ingredient	g/100g
sugar	105
caster sugar white	105
Demerara sugar	105
icing sugar	104

Main ingredients high in Total sugars	Total sugars grams/100g
1.	
2.	
3.	

2. Find foods in the Nutrition Program which contain fibre.

- In the Nutrition Program choose My Recipes and +New Recipe - call it Fibre. Now find some sources of fibre and the function of fibre.
- In Find Ingredient, click Show and change to Food High in Fibre.

Examples of cooking ingredients high in Fibre	Fibre grams/100g
1.	
2.	
3.	



Cook food high in fibre

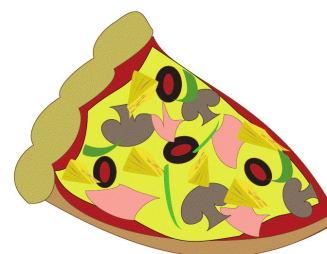
Find a savoury dish that may be low in fibre such as meat casserole, pizza, lasagne or fish pie.

Change the ingredients to increase the fibre.

You could use wholemeal pasta or flour, add vegetables, or include some seeds.

Test the recipe to see if it works.

Compare the fibre content of the low fibre and the higher fibre recipe.



Cook a sweet dish that is high in fibre.

You could choose flapjacks or fruit crumble.

Investigate the fibre content of ingredients that can be used in sweet products.

These could be sesame seeds, pumpkin and sunflower seeds and oats.

Test the recipe and find the fibre content per portion.

Sugar, starch and fibre



Now use the Nutrition Program to find the function of sugar, starch and fibre.

Put 100 grams of wholemeal bread into My Recipes.

Click Nutrition/ Show All and hover over Total sugars, starch and fibre with the mouse.

1. The function of sugar is:

.....

.....

.....

2. The function of starch is:

.....

.....

.....

3. The function of fibre is:

.....

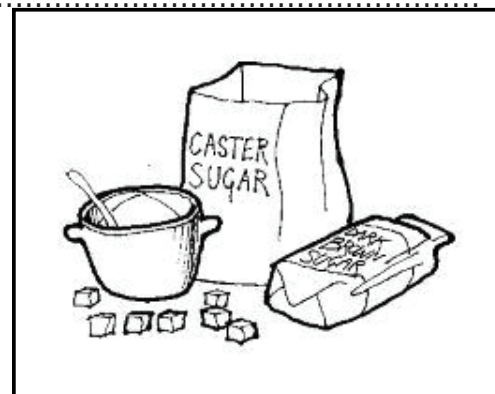
.....

What are Free sugars?

Free sugars are the types of sugars added to food:

- sucrose - table sugar
- fructose - a fruit sugar
- glucose.

Free sugars also include honey, syrups and unsweetened fruit juices.
Free sugars do not include sugars naturally present in intact fruit and vegetables.



Investigation

Find what drinks are high in free sugars.

Use the Nutrition Program to find the sugar content in 5 drinks and put them in order with the highest sugar content first.

Now design a drink which tastes sweet but is low in sugar.

You may need to use sugar substitutes.

Test your recipe using the Nutrition Program.

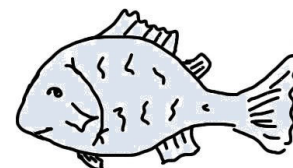


Starch and fibre					
	Per 100g	Per 100g portion	RI (women)	RI (men)	RI (5-10 yrs)
Energy	922 kJ	922 kJ	11%	9%	12%
Energy	217 kcal	217 kcal	11%	9%	12%
Protein	9.4 g	9.4 g	21%	17%	39%
Carbohydrate	42 g	42 g	18%	14%	19%
Total Sugars	2.8 g	2.8 g	3%	2%	3%
Fat	2.5 g	2.5 g	4%	3%	4%
Saturated Fat	0.5 g	0.5 g	2%	2%	2%
Fibre	Needed to keep the gut healthy and prevent constipation. Amount in recipe: 5.0 g per 100g bread (100%)		21%	21%	33%
Salt			20%	20%	30%

Vitamins



Statement from specification - *the micronutrients - fat soluble vitamins - A,D,E.*
Water soluble vitamins thiamin, riboflavin, niacin, folic acid, B12, C.



The Task - vitamins A and D

1. To find foods in the Nutrition Program which contain the vitamins A and D.

- In the Nutrition Program choose My Recipes and +New Recipe - call it Vitamins.
- Find some sources of vitamin A and the function of vitamin A.
- In Find Ingredient, click Show and change to Food High in Vitamin A.
- If the ingredients are dried, you do not use much in a recipe!
- Now repeat for Vitamin D.

Put 100 grams of butter into My Recipes.

Click Nutrition/ Show All and hover over the words Vitamins A, D and E with the mouse.

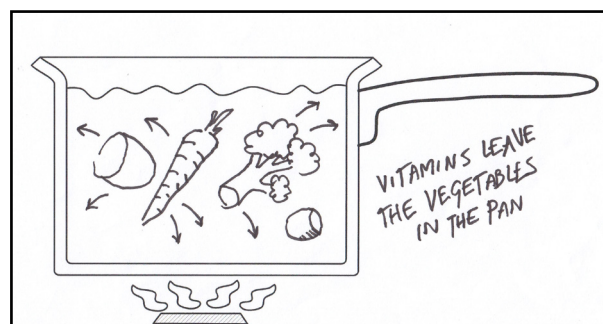
Main ingredients high in vitamin A	Total vitamin A ug/100g
1.	
2.	
3.	

Main ingredients high in vitamin D	Total vitamin D ug/100g
1.	
2.	
3.	

Vitamins	The function of this vitamin
Vitamin A	
Vitamin D	
Vitamin E	



Prepare a fish dish to make recipe high in Vitamins A and D.
 Investigate how to cook vegetables to reduce loss of water soluble vitamins when cooking vitamins B and C.



Vitamins



Statement from specification - *the micronutrients - fat soluble vitamins - A,D,E.*

Water soluble vitamins thiamin, riboflavin, niacin, folic acid (folate), B12, C.

The Task - Water soluble vitamins thiamin, riboflavin, niacin, folic acid, B12, C.

To find foods in the Nutrition Program which contain these vitamins.

- In the Nutrition Program choose My Recipes and + New Recipe - call it Vitamins.
- Find some sources of folic acid (folate) and the function of this vitamin.
- In Find Ingredient, click Show and change to Food High in Folate.
- Now repeat for vitamin C. The Nutrition Program does not sort foods with the other vitamins.

Main ingredients high in folate	Total folic acid/ folate ug/100g
1.	
2.	
3.	

Main ingredients high in vitamin C	Total vitamin C mg/100g
1.	
2.	
3.	

Now use the Nutrition Program to find the function of vitamins thiamin, riboflavin, niacin, folic acid, B12, C.

Put 100 grams of orange into My Recipes. Click Nutrition/ Show All and hover over the vitamins with the mouse.

Vitamins	The function of this vitamin
Thiamin	
Riboflavin	
Niacin	
Folic acid - folate	
B12	
Vitamin C	

Minerals



Statement from specification - *the micronutrients - calcium, iron, sodium, phosphorus*

The Task - Calcium, Iron and Salt/Sodium

To find foods in the Nutrition Program which contain the minerals - calcium, iron and salt (sodium).

- In the Nutrition Program choose My Recipes and + New Recipe - call it Minerals.
- Find some sources of calcium and the function of calcium.
- In Find Ingredient, click Show and change to Food High in Calcium.
- If the ingredients are dried, such as herbs and spices you do not use much in a recipe so they are not good examples!
- Now repeat for Iron and Salt (Sodium).

Minerals

Find Ingredient

Show:

Food high in Calcium

Ingredient	mg/100g	
basil, dried	2110	+
marjoram, dried herb	1990	+
thyme, dried, ground	1890	+
dill, dried	1780	+

Main ingredients high in calcium	Total calcium mg/100g
1.	
2.	
3.	

Main ingredients high in iron	Total iron mg/100g
1.	
2.	
3.	



Cook a meal for a teenage girl that is high in calcium and iron.
 Use the Nutrition Program to find foods that are high in calcium and iron.
 Choose some of them to create a meal.
 Test out the recipes and then analyse the results to show the mineral content.



Minerals



Salt is made from sodium chloride.

Use the Nutrition Program to find foods high in salt. This also means they are high in sodium.

Main ingredients high in salt	Total salt g/100g
1.	
2.	
3.	

Now use the Nutrition Program to find the function of calcium, iron, salt, phosphorus and iodine. Put 100 grams of wholemeal bread into My Recipes. Click Nutrition/ Show All and hover over Calcium, Iron, Salt and Sodium, Phosphorus and Iodine with the mouse.

1. The function of calcium is:

.....

.....

.....

2. The function of iron is:

.....

.....

.....

3. The function of salt/sodium is:

.....

.....

.....

Vitamin K1	1.1 µg	0.6 µg
Sodium*	145 mg	80 mg
Salt	0.4 g	0.2 g
Calcium	Essential for cells and control of body fluids. Limit intake to 6g a day. Amount in recipe: 0.4 g per 100g	17 mg
Phosphorus	butter (63%), chicken breast (20%), egg (14%), cooking apple (0%), aduki beans (0%), cinnamon (0%), caster sugar white (0%)	55 mg
Iron*		0.6 mg
Magnesium*	25 mg	14 mg
Zinc*	1.1 mg	0.6 mg

4. The function of phosphorus is:

.....

.....

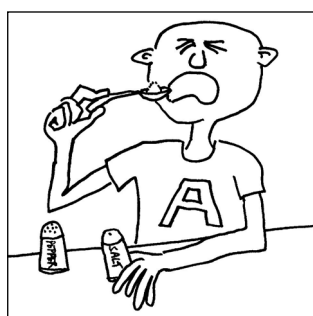
.....

5. The function of iodine is:

.....

.....

.....



Eat less salt!

Functions of nutrients



Hover over answers from the Nutrition Program to go with the worksheets.

AOAC Fibre – includes lignin and resistant starch – higher figure than NSP.
 Calcium – Helps build strong bones and teeth.
 Carbohydrates – A source of energy. Include starch, sugar and fibre.
 Cholesterol – High blood cholesterol is one of the risk factors in heart disease.
 Dietary Reference Values (DRVs) – the values for nutrient intake of energy and nutrients.
 Energy – Measured in KJ and Kcal. Needed to keep us alive and active.
 Estimated Average Requirement (EAR) – The requirement for energy values.
 Fat – good source of energy and supplies essential fatty acids that the body can't make.
 Fat soluble vitamins A and D, E.
 Fibre – Needed to keep the gut healthy and prevent constipation.
 Folate – Prevents neural tube defects in developing embryos. (B9)
 Iodine – Helps make the thyroid hormones and keep metabolic rate healthy.
 Iron – Helps make red blood cells, which carry oxygen around the body.
 Macronutrients – the nutrients that we need in larger amounts to keep healthy protein, fat, carbohydrate.
 Micronutrients – the nutrients that we need in small amounts to keep healthy – vitamins and minerals.
 Mono Unsaturates – These types of fats can reduce cholesterol levels.
 Niacin – Needed for the release of energy from carbohydrates.
 NSP Fibre Non Starch polysaccharide – needed for healthy digestive system.
 Phosphorus – Helps build strong bones and teeth.
 Polyunsaturates – These types of fats can reduce cholesterol levels.
 Protein – Needed for growth and repair, a source of energy.
 Reference Nutrient Intake (RNI) – The amount of a nutrient that is sufficient for most needs
 Riboflavin – Helps release energy from carbohydrates.
 Salt – Essential for cells and control of body fluids. Limit intake to 6g a day.
 Saturated fat – Too much saturated fat can increase the cholesterol in the blood.
 Sodium – Salt is made from sodium chloride.
 Starch – Polysaccharide made up of glucose units. Used for energy.
 Thiamin – Needed for the release of energy from carbohydrates. (B1).
 Total sugars – All types of sugar in the food.
 Total sugars are all types of sugar in food. A source of energy.
 Trans fatty acids – These raise the type of cholesterol in the blood that increases the risk of heart disease.
 Vitamin A – Needed for growth, development and eyesight. Retinol and Carotene.
 Vitamin B12 – for blood cells and nerve function. (cobalamin).
 Vitamin B6 Pyridoxine – essential for good health and red blood metabolism.
 Vitamin C – Needed for healthy skin and tissue, and to aid the absorption of iron. Ascorbic acid.
 Vitamin D – Regulates the amount of calcium and phosphate in the body.
 Vitamin E – Helps protect cell membranes by acting as an antioxidant.
 Vitamin K – Helps protect cell membranes by acting as an antioxidant.
 Water soluble vitamins – B1 (thiamin), B2 (riboflavin), B3 (niacin), B6 (pyridoxine), Vitamin C.

Sources of energy used by the Nutrition Program

Nutrient	% of food energy
Total Carbohydrate	50%
Fibre as non-starch polysaccharide	18%
Total Fat	Not more than 35%
Saturated Fatty Acid	Not more than 11%
Polyunsaturated Fatty Acid	6.5%
Monounsaturated Fatty Acid	13%
Non-milk intrinsic sugars	Not more than 11%
Intrinsic milk sugars and starch	39%

