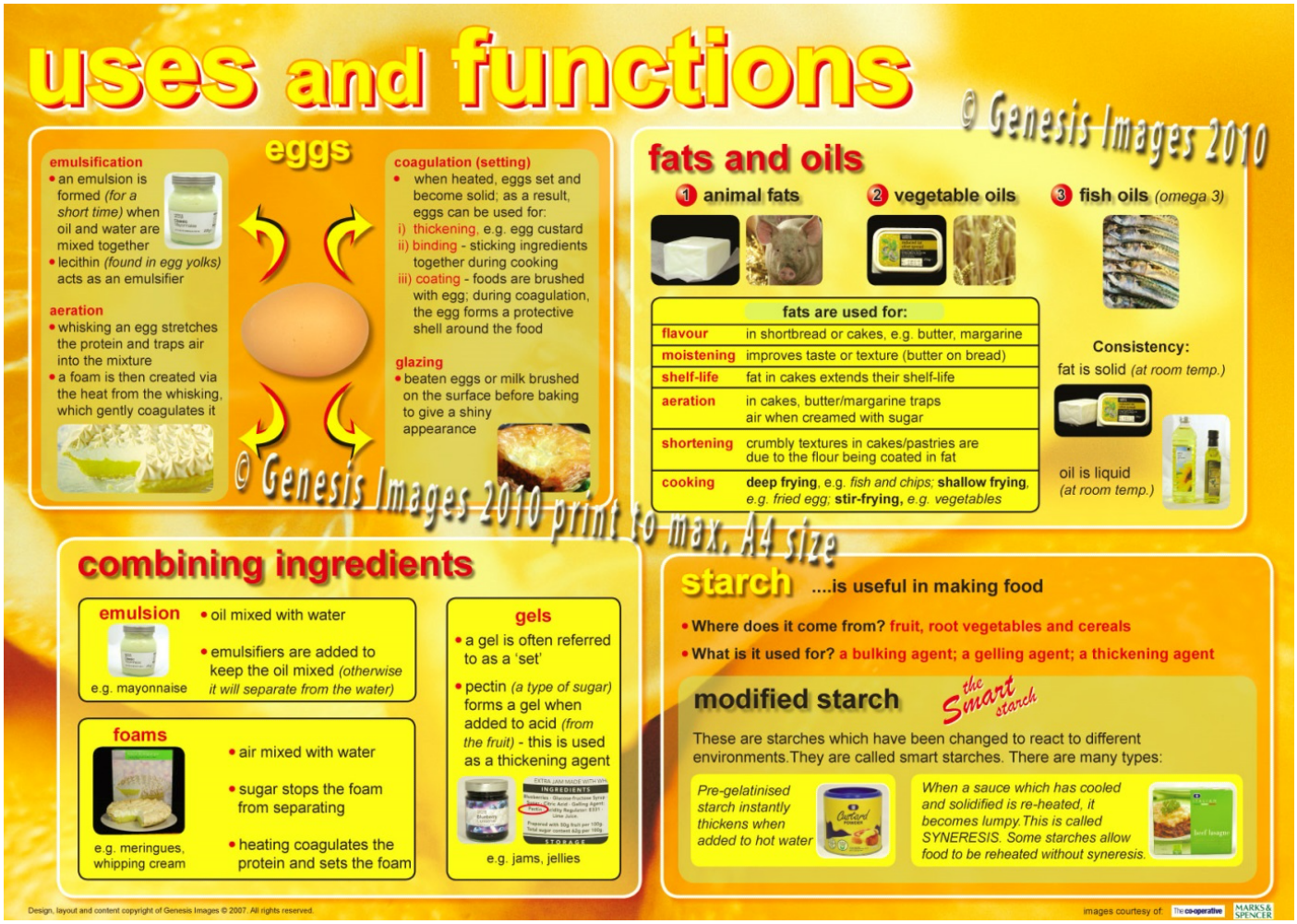
Understanding and Using Ingredients

Unit 4



Name: _____

HERBS AND SPICES

A wide range of herbs and spices are available fresh, dried and frozen to add flavour to your food and reduce the need for salt.

How many can you name?

Fill in the missing letters to identify the following **herbs.**

P _ _ S _ _ _

D _ _ L

S _ G _

M _ _ T

O _ E G _ N _

T H _ M E

T _ R R _ G _ N

B _ S _ L

Fill in the missing letters to identify the following **spices.**

P _ P P _ R

P _ P _ _ A

G _ _ G _ R

C _ N _ A M _ N

C H _ L _ I

C _ R I _ _ D _

FLAVOURINGS & SEASONINGS

1 Other than herbs and spices, can you name 6 other ingredients which are used to flavour and season the food you make?

2 What is the storage advice given for each of the ingredients?

Ingredient	Storage

3 Thinking about the current dietary advice, Are any of your chosen ingredients named within the goals? Can state the goal(s) and give reasons why it is important to meet each one.

Ingredient	Current Dietary Advice and Goals

4 What alternative ingredients could be chosen for this category?

FLOUR ADVISORY BUREAU FACTSHEET ON FLOUR

Flour is one of the most important ingredients in the UK and we use more flour than you might think.

Interesting facts about wheat and flour.

- One whole grain of wheat makes over 20,000 particles of flour.
- It takes around 350 ears of wheat to make enough flour for one 800g loaf of bread.
- Breadmaking flour accounts for just over 75% of flour production in 2016.
- UK flour consumption per person was about 58kg in 2016; bread consumption was 28kg per person.
- UK flour is not bleached.

The Role of Flour in the Diet

It is a major source of dietary energy, fibre and micronutrient intake.

Nutrient	Content per 100g (source: McCance & Widdowson, Composition of Foods, 7th Ed)			
	Wholemeal flour	White bread flour	White plain flour	Brown flour
Energy	327kcal	353kcal	352kcal	339kcal
Protein	11.6g	11.3g	9.1g	12.2g
Fat	2.0g	1.2g	1.4g	2.0g
Fibre (AOAC)	10.1g	3.3g	4.0g	7.7g
Calcium	32mg	134mg	96mg	28mg
Iron	2.5mg	1.9mg	1.9mg	2.4mg
Folate (Folic Acid)	27mcg	16mcg	16mcg	44mcg

Types of Flour

- **Wholemeal** – This is made from the whole wheat grain with nothing added or taken away.
- **Brown** – This usually contains about 85% of the original grain. Some bran and germ have been removed.
- **White** – This usually contains around 75% of the wheat grain. Most of the bran and wheatgerm have been removed during the milling process.

- **Wheatgerm** – This can be white or brown flour with at least 10% added wheatgerm.
- **Granary** – This is brown or wholemeal flour with added malted grains.
- **Organic** –This is made from grain that has been grown to organic standards. Growers and millers must be registered and are subject to regular inspections.
- **Spelt** – an older version of wheat

Non-wheat Flours (Suitable for Coeliacs / Gluten Intolerance)

- Other grains used include rye, maize and oats.
- Flours can also be made from nuts such as hazelnut and also coconut, potato, peas and chickpeas.

Which Flour is Best for the Job?

Dish	Flour Required	Dish	Flour Required
Batter	Plain flour	Pastry	Plain flour
Biscuits	Plain flour	Pizza	Strong flour AKA breadmaking flour
Bread	Strong flour AKA breadmaking flour	Scones	Self-raising flour OR strong flour
Cakes	Self-raising flour (or plain flour with baking powder)	Sauces	Plain flour (or cornflour)
Crumpets	Strong flour AKA breadmaking flour	Yorkshire puds	Plain flour

Storage

- Flour should be stored in its original packaging or in an air tight container on a shelf or in a cupboard in a cool part of your kitchen.
- Never mix old flour with new flour.
- Wholemeal flour keeps less well than white flour as the oils from the germ and bran can become rancid with age. Wholemeal flour will normally keep for about three months while white flour will be OK to use for six to nine months.
- If moisture is allowed to get into the flour, it may cause it to become clumpy. In some cases, flour can attract psocids (Psocids are tiny brown or black insects which live in dry foods).

DRY INGREDIENTS

1 Other than FLOUR, can you name 6 other ingredients which are used in the food you make?

2 What is the storage advice given for each of the ingredients?

Ingredient	Storage

3 Thinking about the current dietary advice, Are any of your chosen ingredients named within the goals? Can state the goal(s) and give reasons why it is important to meet each one.

Ingredient	Current Dietary Advice and Goals

Ingredient (continued)	Current Dietary Advice and Goals

4. What alternative ingredients could be chosen for this category?

FRUIT AND VEGETABLES

Healthy eating includes eating at least five portions - ideally 7-9 portions - of a variety of fruit or vegetables each day. Fruit and vegetables include fresh, frozen, tinned, or dried varieties, and fruit juice. On average, people who eat lots of fruit and vegetables tend to be healthier and live longer.

What are the Health Benefits of Eating Fruit and Vegetables?

- You have a lower chance of developing cardiovascular disease or a stroke due to 'hardening of the arteries'.
- You have a lower chance of developing some cancers, such as bowel and lung cancer.
- You have a lower chance of developing obesity and type 2 diabetes.
- Having a low intake of fruit and vegetables is estimated to cause about 19% of cancers of the digestive system, 31% of heart disease and 11% of stroke.

Nutritional Benefits of Fruit and Vegetables

- Contain lots of fibre which helps to keep your bowels healthy. Problems such as constipation and diverticular disease are less likely to develop.
- Contain plenty of vitamins and minerals, which are needed to keep you healthy.
- Are naturally low in fat.
- Are filling but are low in calories, so they are ideal to keep your weight under control.

Why '5-a-day'?

- We encouraged to eat at least five portions of fruit and vegetables each day. The World Health Organization collected evidence together in 1990. It was found that a minimum of 400 g (about five 80 g portions) was needed.
- In fact, five portions of fruit and vegetables each day is the **minimum.**
- Vegetables are seen to be more beneficial to health than fruit as they contain less sugar.

What is One Portion of Fruit or Vegetables?

- One large fruit such as an apple, pear, banana, orange, or a large slice of melon.
- Two smaller fruits such as plums, kiwis, satsumas, clementines, etc.
- One cup of small fruits such as grapes, strawberries, raspberries, cherries, etc.

- Two large tablespoons of fruit salad, stewed fruit or canned fruit.
- One tablespoon of dried fruit.
- One glass of fresh fruit juice (150 ml).
- A normal portion of any vegetable (about two tablespoons).
- One dessert bowl of salad.
- Three heaped tablespoons of beans, pulses or lentils.

Note: a 150 ml glass of fruit juice counts as only one of your 'five a day', even if you have more than one glass. This is because during processing much of the fibre has been removed and the sugar is released from the plant cells, meaning there are higher levels of 'free sugars'.

Currently only about a third of the UK adults meet the 'five-a-day' recommendation, and only about one in ten people aged 11-18 years.

How to increase fruit and vegetables in your diet

- Fruit and vegetables add colour, flavour and texture to any dish. No one fruit or vegetable contains all the nutrients you need, so it is good to have a variety and include fruit and vegetables of all different colours. Different colours of fruits mean different combinations of vitamins and minerals.
- Try adding chopped bananas, apples, or dried fruits to breakfast cereals.
- Instead of a fruit yoghurt, have a piece of fruit with a dollop of natural yoghurt.
- Aim to include at least two different vegetables with most main meals.
- Add tomato purée and/or tinned chopped tomatoes as a pasta sauce or in casseroles and stews.
- Sometimes nutrients are lost or destroyed during cooking. Eat fruit and vegetables raw when possible and try to avoid over-cooking them.
- Try poaching, steaming or microwaving rather than boiling. These methods help to reduce the amounts of nutrients lost or destroyed. If you do boil vegetables, the water can be used in stocks, sauces or soups.
- How about cherry tomatoes, carrot sticks, dried apricots, or other fruits as part of packed lunches? A banana sandwich is another idea for lunch.
- When making sandwiches, try to add in cucumber, tomato, lettuce or avocado to accompany sandwich fillings.
- Bulk out meals with vegetables, beans and pulses. For example, when making a Bolognese, add in chopped mushrooms, red peppers and some kidney beans. This also helps to make meals go further.
- Fruit is great for snacks. Encourage children to snack on fruit rather than eating sweets.

What doesn't Count as Fruit or Vegetables?

- Potatoes, yams, cassava and plantain: these contain more starch than anything else, so they don't count as a portion.
- Fruitcake/fruit yoghurts: these contain little fruit and also have added sugar, fat and other ingredients. So we should be trying to keep these to a minimum in the diet.
- Fruit-flavoured soft drinks: these usually contain minimal fruit and are high in sugar.
- Tomato ketchup, jam and chutneys: these have high salt/sugar content.

Safety, Handling and Storage

- Was all fruit and vegetables to remove soil, insects, bacteria, pesticides and fertilisers.
- A green chopping board should be used for preparing fruit / salads and a brown board for vegetables.
- Storage varies with salads requiring refrigeration and most other fruits and vegetables needing a cool, dark place. Bananas should be kept separately.

Activity: Research the fruit and vegetable portions, filling in the table below:

Fruit / Vegetable	Portion Amount
Unsweetened fruit juice	
Fruit Salad	
Peas or Sweetcorn	
Grapes	
Banana	
Plum	
Salad	
Homemade Soup	
Dried Fruit	

MEAT AND POULTRY

Meat and poultry are an important part of the diet for people in many countries. They provide us with high biological value (HBV) proteins which contain all of the essential amino acids.

Meat comes from animals whereas poultry comes from birds. Offal is the edible internal organs of an animal.

Create three mind-maps in the space below to show different types of meat and poultry, including game,that could be part of our diet. Also mind-map the different types of offal which is eaten.

Meat

Offal

Poultry

RED MEAT

Meat is an important food commodity which provides nutrients essential for health.

A variety of different textures, colours and flavours of meat are available for you to choose.

The UK government recommends eating around 70g (cooked weight) of red meat a day and the majority of people in the UK are well within this target.

Types of Meat

Red meat eaten in the United Kingdom (UK), comes mainly from:

Cattle (beef)	Sheep (lamb)	Pigs (pork)
		
		

Why is red meat good for you?

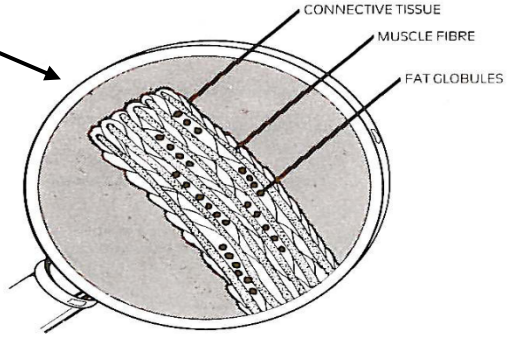
Animal flesh consists of muscle tissue or fibres, connective tissue and fatty (adipose) tissue.

Lean meat is the muscle tissue of animals.

Muscle cells comprise of:

- water proteins - the red protein called myoglobin (similar to the blood pigment haemoglobin)
- minerals – iron, phosphorus and zinc
- vitamins – B group (B2, B3, B6 and B12)
- fat - saturated

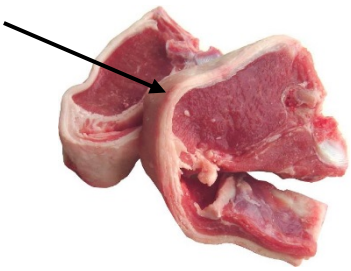
Connective tissue is made up of two proteins called collagen and elastin.

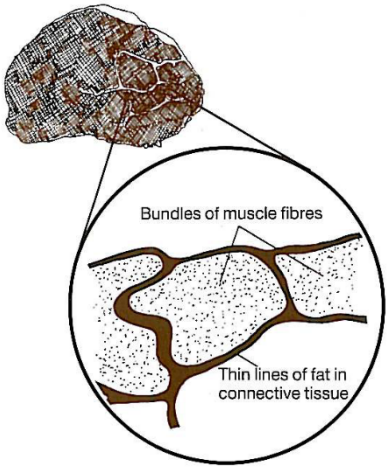


Collagen
The connective tissue in and around the muscle fibres and tendons is mostly collagen. When meat is cooked, the collagen becomes soft and soluble, and forms gelatine.

Elastin
This is much more elastic connective tissue. It is yellow in colour and remains tough, even when cooked. The ligaments which join two bones together are mostly made up of elastin.

Two different types of fat can be found in meat, visible and invisible.





The colour of meat varies due to the red protein called myoglobin and some haemoglobin remaining in the muscles. Exposure to oxygen increases the red colour of meat.

Cuts of Meat

- **Boneless cuts** (beef, pork and lamb) – economical and suitable for quick and easy methods of cooking, e.g. grilling.
- **Boned and rolled joints of meat** – smaller joints to reduce cooking time and making it easier to carve.
- **Lean and extra lean cuts** – trimmed cuts of meat which are lower in fat.
- **Cubes of meat** – sold cut into cubes, ready for making stews, kebabs and casseroles.
- **Lean minced meat** – meat is trimmed of fat and minced.
- **Thin strips** – meat is pre-cut into strips, suitable for quick cooking methods, e.g. stir-frying.

What Happens to Meat during Cooking?

- Long cooking – on a low heat, in a liquid - will help make tougher meats tender. At temperatures of 80°C and above the collagen is softened and converted to gelatine (which is soluble).
- Muscle fibres cooked in this way fall apart easily and are easier to chew.
- Acid ingredients (such as wine, lemon juice and tomatoes) added to the liquid during cooking aid the conversion of collagen to gelatine and add flavour.

Handling and Storage

- All raw and cooked meat needs to be handled hygienically and must be properly packaged.
- A red chopping board should be used for preparing any raw meat and yellow for cooked.
- It must then be stored at the correct temperature to prevent the action and multiplication of micro-organisms.
- Raw & cooked meats should be stored in the refrigerator between 0-4°C.
- It should be covered and stored away from other fresh foods in the refrigerator.
- For extended shelf life meat needs to be frozen.

Sustainability Considerations

When choosing meat you may wish to consider the following factors:

- **Red Tractor:** The Red Tractor label is used as a mark of assurance and quality. It guarantees the welfare of the animals, full traceability and ensures the country of origin of the product it is attached to. So, if the logo carries the Union Jack flag you know the product comes from a UK farm.
- **RSPCA Assured:** Previously Freedom Food. The RSPCA's Assurance is an ethical food label dedicated to farm animal welfare. Their vision is for all farm animals to have a good life and be treated with compassion and respect.
- **Free-range:** Free-range denotes a method of farming husbandry where the animals, for at least part of the day, can roam freely outdoors, rather than being confined in an enclosure for 24 hours each day. On many farms, the outdoors ranging area is fenced, thereby technically making this an enclosure, however, free range systems usually offer the opportunity for extensive locomotion and sunlight prevented by indoor housing systems. Free range can apply to eggs and dairy farming as well as meat.

- **Organic:** As well as requiring that animals are genuinely free range, Soil Association organic standards cover living conditions, food quality, the use of antibiotics, as well as transport and slaughter. These standards mean that animals raised organically enjoy the very highest welfare standards of farmed animals.

Information from
www.meatandeducation.com
and QMS

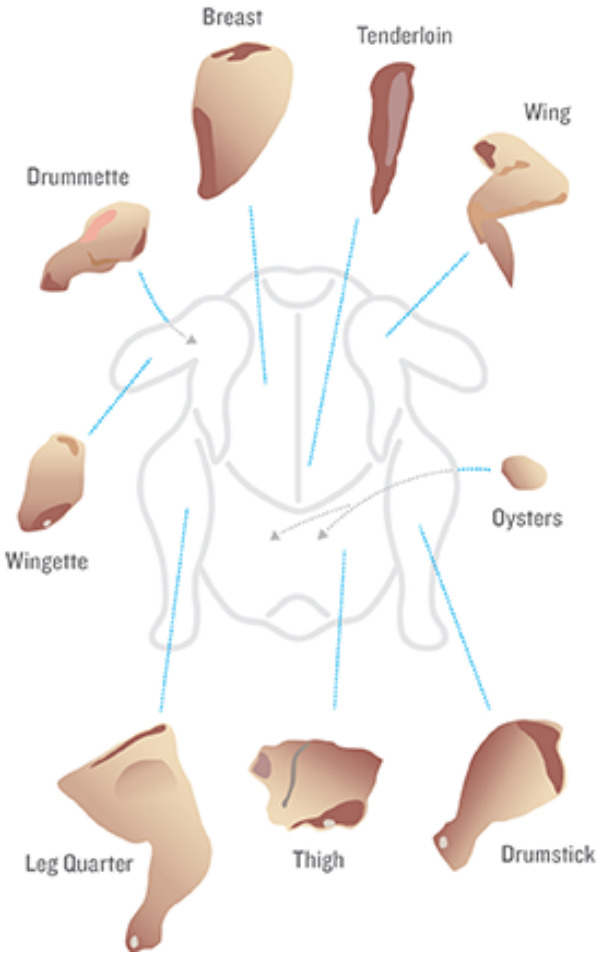
POULTRY

Poultry is the category of domesticated birds that people keep for the purpose of collecting their eggs and/ or killing for their meat. Poultry also includes wild birds which are killed for their meat, such as pigeons or birds considered to be game, like pheasants. The term also refers to the flesh of such birds.

- **Domestic birds eaten for food include:** chicken, turkey, duck and goose
- **Feathered game eaten for food include:** guinea fowl, pheasant, quail, pigeon, grouse, partridge, woodcock, duck (mallard)

What are the Signs of Quality to look for?

- Standard/barn (reared indoors with no natural light ~ 95% all farmed), free-range, organic, corn-fed
- Check the use-by date
- Odourless, smells fresh
- Moist but not slimy or wet
- Look for a good plump breast
- Firm unblemished skin
- Well plucked and/or unsinged



Cuts of Chicken

Which cuts of poultry are described as "red" or "dark" and which are "white"?

Red / Dark

White / Light

Nutritional Value of Chicken per 100g

Nutrient	**Meat and Skin per 100g**	White Meat per 100g
Energy (kcal)	201	106
Protein (g)	19.1	24
Fat (g)	4	1.1
Vitamins	A, D, B6 and B12	
Minerals	Selenium	

Health and Safety Points

- All poultry contain low levels of Salmonella and Campylobacter
- Refrigerate as soon as possible after buying (remember the 20 minute rule)
- If the bird contains giblets remove and store in a separate container
- Wash hands before and after handling
- Ensure correct utensils are used for preparation
- Cook thoroughly until the juices run clear
- Refrigerate leftovers as soon as possible and eat within 2 days

Fresh Storage

- Store between 0 ^{0}C and 4^{0}C
- Keep well wrapped and/or in a container at the bottom of the refrigerator (drip)
- Cook by the use-by date

Frozen Storage

- Store <18^{0}C for up to 3 months
- Keep well wrapped to prevent freezer burn
- Defrost thoroughly before cooking

Activity

Research and write down examples of some classic poultry dishes.

ALTERNATIVE PROTEIN FOODS

These are food products high in protein. They also contain some fibre and micronutrients and are low in fat (particularly saturates); the consumption of soy protein (25g/day) can help to lower blood cholesterol levels. They are suitable for vegetarians

Some people choose not to eat meat for a variety of reasons and obtain all their protein from other sources. In recent years manufacturers have produced many meat-like products, which mimic the sensory properties (i.e. the aroma, taste, texture and appearance) of meat and can be used to replace or extend meat in traditional products, *e.g.* textured vegetable protein (TVP) and myco-protein.

There are several meat replacement products available including tofu, textured vegetable protein (TVP) and Quorn™.

Tofu: Tofu is made by curdling soya milk (made from soya beans) with calcium sulphate. The liquid separates into solids, curds, and liquid, whey. The form curd is called tofu, which needs to be eaten fresh. It and is sold as blocks packaged in water.

- Firm tofu – this is dense and can be cubed and deep-fried, stir-fried, grilled, scrambled, pickled, smoked, baked, barbecued or served in soups. Firm tofu is higher in protein, fats and calcium than other types of tofu. It can also be purchased smoked or marinated.
- Silken tofu - has a creamy structure and is also used in blended dishes. In Japan, silken tofu is consumed as such with some soy sauce. It can also be used for dips, spreads, sauces and sweet dishes. It has a high protein content, tofu also contains calcium, iron, and vitamins B1, B2 and B3.

Textured Vegetable Protein: TVP is made from soya bean flour with the fat removed. TVP has a meat-like texture and has small holes. Plain TVP may have a 'beany' taste, so needs to be flavoured. It may be used to reduce the cost of a product, e.g. economy cottage pie, and is used in sausages, burgers and pasta dishes. TVP can be made into burgers, burger mixes, sausages and ready meals.

Quorn™: is a fungus, mycoprotein, which is grown in a glucose mix in a tall fermenting tower. When the mycoprotein has grown sufficiently, it is pumped into a series of centrifuges which are like spin dryers. These centrifuges separate the mycoprotein from the liquid and leave a creamy-coloured dough. This dough is heat-treated and is then mixed with vegetable-based flavourings

and in some cases egg white, rolled into sheets and then set by steaming. Quorn™ can be sliced, diced or cut into chunks and made into ready meals such as curries, pies and stir-fries.

Quorn™ is a source of protein, fibre, iron and zinc, and is low in saturated fat.

Not all Quorn™ is not suitable for vegans as it contains egg white.

Comparing the Nutritional Value of Quorn With Meat

Quorn

Nutrition

Typical Values	Typical values per 87g serving
Energy -kJ/kcal	387/92
Protein	12.7g
Carbohydrate	3.9g
- of which sugars	0.5g
Fat	1.8g
- of which saturates	0.4g
Cholesterol	Nil
Fibre	4.8g
Sodium	0.1g
Salt equivalent	0.2g

Beef Mince

Nutrition

Typical Values	100g shallow fried contains
Energy	1200kJ (290kcal)
Protein	23.3g
Carbohydrate	0g
Sugars	0g
Fat	21.7g
Saturates	10.8g
Mono Unsaturates	9.9g
Polyunsaturates	0.8g
Fibre	0g
Sodium*	0.1g
*Salt Equivalent	0.4g

1. Which has more protein?

2. Why do you think that is?

3. Which contains more fibre?

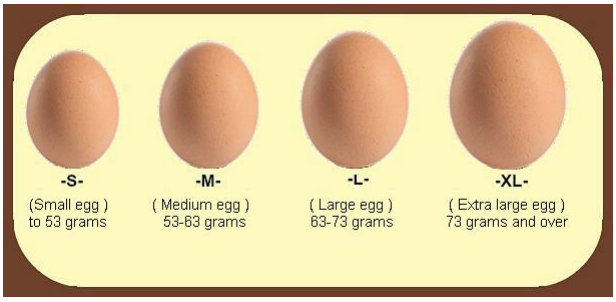
4. Which contains more fat?

5. Which do you think is healthiest?

6. Why do you think that?

EGGS

Eggs have been used as food for centuries. **10,372 million eggs were produced in the UK in 2016.** In the UK the supermarkets, local shops, markets and farm shops also sell eggs from ducks, quails, goose and even ostrich.



Egg type breakdown	
Total Market (Defra) 2016	
Laying cage	48%
Free Range	50% (inc estimated 2% organic)
Barn	2%

Composition of an Egg

	Whole Egg	Egg Yolk	Egg White
Water	65.5%	50.0%	88.0%
Protein	11.8%	17.0%	12.5%
Fat	11.0%	34.0%	0%
Ash	11.7%		
Vitamins		A, D, E	
Minerals		Phosphorus, manganese, iron, iodine, copper, calcium and zinc.	Niacin, riboflavin, chlorine, magnesium, potassium, sodium and sulphur.
Other Information		Contains lecithin a natural emulsifier	

Safety, Storage and Handling

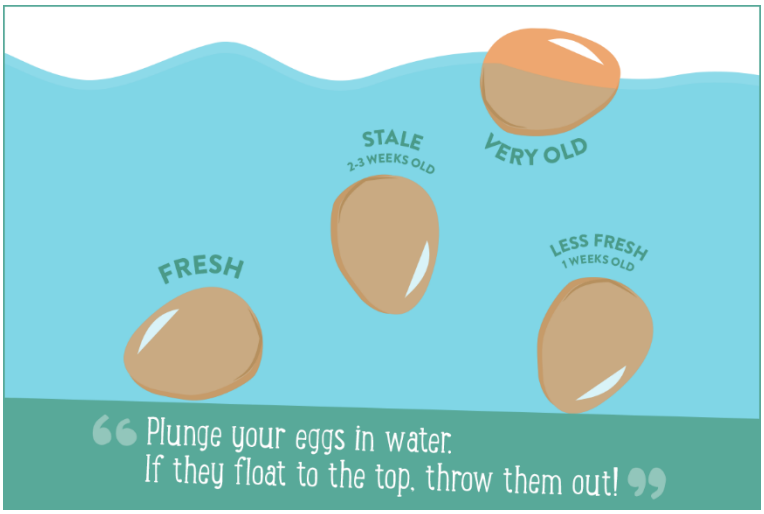
- Look for the British Lion mark to guarantee that the eggs have come from hens vaccinated against salmonella
- Make sure that there is a best before date on the egg - this is not a legal requirement, but all British Lion eggs are date-stamped
- Keep eggs in their original boxes when storing - this ensures any odours from surrounding foods are shut out
- If you take eggs out of their box, make sure you store and use them in date order
- Store eggs at a constant temperature below 20°C - this maintains freshness and quality. If refrigerated, take them out of the fridge half an hour before cooking for the best results, otherwise the sudden change in temperature could crack the shell or lower its binding qualities in baking
- Store away from strong smelling food - egg shells are porous
- Store away from raw meat
- Wash your hands before and after handling eggs
- Never use dirty, cracked, or broken eggs

Changes that Take Place during Storage

- The air space gets bigger
- Water moves into the yolk from the white. The yolk increases in size and becomes less viscous (jelly like)
- The skin surrounding the yolk becomes weaker which means that the yolk could break into the white
- The egg white becomes thinner because the amount of egg white protein decreases
- The pH rises (carbon dioxide is lost from the egg) – this can affect some cooking processes like whisking egg white into a good foam (a pinch of cream of tartar speeds up foaming of an egg with a high pH

Testing for Freshness

- You can test an egg to see how old it is and if its still fresh enough to use.
- Carefully drop the egg into a bowl of water.



Use of Eggs in Cooking

- Egg-white proteins coagulate at temperatures ranging between 60°C and 65°C. A colour change occurs from translucent (clear) to opaque white.
- When the egg white reaches 70°C it is firm
- Egg-yolk proteins start to coagulate at a slightly higher temperature of 65°C

Binding	Beaten eggs bind ingredients together so they hold their shape when cooked. The egg proteins coagulate when heated & bind the ingredients to produce an unbroken, prefect result – as in fishcakes, meatballs and burgers.
Coating	Beaten eggs are used to coat products and enable dry ingredients to be attached (e.g. breadcrumbs) The beaten egg is brushed on the surface of a product. The crumbs stick to the egg & are kept in place as the egg coagulates during cooking. The coating formed in this way acts as a protective layer between the product and heat source thus preventing the product from becoming dry and overcooked.
Emulsifier	Eggs contain lecithin which prevents oil and water mixtures separating (e.g. salad dressing) Egg yolk combined with a mixture of oil and another liquid produces a thick result which is stable. For example in mayonnaise the egg yolk prevents the oil from separating from the vinegar.
Coagulation / Setting	(Usually) beaten eggs are added to a liquid mix which on cooking coagulate and set the mixture, e.g. quiche and baked cheesecake.

Trapping Air / Foaming	Egg white can increase in volume by as much as eight times then it is beaten. Egg white traps air when beaten & produces a large mass of bubbles called foam. An example of this is meringue. Whole egg can be whisked to increase its volume but to a lesser extent, e.g. whisked sponge (Swiss roll)
Thickening	Beaten egg can be used to thicken products (e.g. crème Anglaise or lemon curd) Liquids such as flavoured milk will thicken when mixed with eggs and heated
Glazing	Beaten whole egg or yolk can be used to create a shiny glaze on pastry. Egg white and sugar creates a crystallised glaze on sweet pastry products. The egg coagulates in the heat and makes a permanent glaze
Enriching	The egg yolk or whole egg is added to a product to improve the nutritional value, e.g. pastry or bread dough.
Garnish	Eggs can be cooked and used as garnish to products (e.g. sliced hard boiled egg, shredded omelette)

Why are Eggs added to Cakes?

- Eggs are added to most cake mixtures to trap air during whisking with sugar in sponges or during beating into creamed mixtures. Eggs can "hold" large volumes of air.
- To help to set the cake once it has risen during baking, by coagulation of the protein
- To add colour and nutritional value.
- To emulsify the fat in creamed mixtures.
- When added to creamed mixtures, eggs should be at room temperature. If they are too cold, the mixture may curdle.

Activity

Explain what functions and uses of eggs apply when making the following dishes:

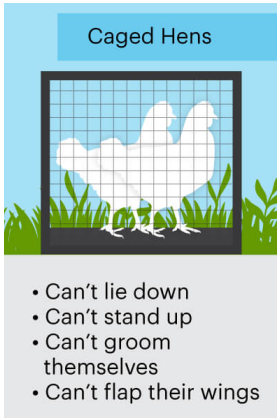
1. Fishcakes

2. An egg flan / quiche

3. A lemon meringue pie

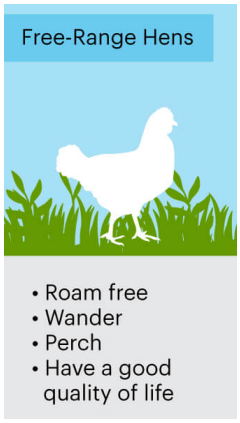
Sustainability Considerations
When choosing eggs you may wish to consider the following factors:

Caged: Across the EU conventional 'battery' cages have been banned. In the UK, they have been replaced by larger, 'enriched' colony cages. The new colony cages provide 750cm² per bird along with a nest box for the birds to lay their eggs in, perching space for the birds to sleep on and a scratching area to perform natural behaviours. Most of the new enriched colony cages are designed to contain between 40 and 80 birds, enabling better use of the space and giving them more room to move around the colony



Barn: In the barn system hens are able to move freely around the house with a maximum stocking density of 9 hens per square metre of useable floor space. Perches for the hens must be installed to allow 15 centimetres of perch per hen. Litter must account for one third of the ground surface. This is used for scratching and dust bathing. One nest box per five hens or communal nests, at the rate of 120 birds/m² of floor area, is provided. Electric lighting is provided to give an optimum day length throughout the year. At the end of the laying period the house is completely cleaned and disinfected.

Free-range: The EU egg marketing legislation stipulates that for eggs to be termed 'free range', hens must have continuous daytime access to runs which are mainly covered with vegetation and a maximum stocking density of 2,500 birds per hectare. Hens must be provided with nest boxes. Adequate perches, providing 15 centimetres of perch per hen, must also be provided.



Organic: Hens producing organic eggs are always free range. In addition, hens must be fed an organically produced diet and ranged on organic land. The hen house conditions for organic hens are set by the EU Organic Regulations and stipulate a maximum stocking density of 6 hens per square metre of useable area and a maximum flock size of 3,000 birds. Hens must be provided with nest boxes. Adequate perches, providing 18 centimetres of perch per hen, must also be provided

FISH

Fish is a high-protein, low-fat food that provides a range of health benefits. White-fleshed fish, in particular, is lower in fat than any other source of animal protein, and oily fish are high in omega-3 fatty acids, or the "good" fats. Since the human body can't make significant amounts of these essential nutrients, fish are an important part of the diet. Also, fish are low in the "bad" fats commonly found in red meat, called omega-6 fatty acids.

White fish	Approximate percentage	**Oily fish**
17.5%	**Protein**	18.6%
Nil	**Carbohydrate**	Nil
0.5%	**Fat**	10.9%
80.0%	**Water**	67.5%
1.2%	**Mineral elements** Iodine, fluorine, phosphorus, sodium and potassium	2.6%
Small amounts of B1 thiamine and riboflavin	**Vitamins**	A D Good source of B1 thiamine and riboflavin

White fish	Energy value	**Oily fish**
70 kcal	Approximate energy value per 100g	200 kcal

There are three types of fish: oily fish, white fish and shellfish.

Oily Fish	White Fish	Shellfish
Salmon	Cod	Crabs
Mackerel	Plaice	Mussels
Fresh tuna	Whiting	Oysters
Trout	Haddock	Lobster
Sardines	Sole	Prawns
Herring	Hake	

Oily fish are a rich source of vitamins A, D and E. They are also rich in essential omega-3 fatty acids which are essential for healthy brain, eye and nerve development in babies and children.

Dietary Recommendations

- Two portions of fish a week are recommended including one portion of oily fish.

Ways you can buy your fish

- **Fresh**: Full of flavour and convenient to prepare and cook.
- **Frozen**: Frozen fish with no coatings has the same nutritional content as fresh fish.
  Fish often comes breaded, battered and in sauce – choose those with lowest salt and fat.
- **Canned**: Keep as an essential in your store cupboard – ideal for making a meal when you're in a hurry. Choose canned fish in mineral water over brine and oil.
  Note: Canned tuna does not contribute to a portion of oily fish as the fatty acids are destroyed during the canning process.
- **Smoked**: Choose varieties with lower salt content.

Safety Precaution

- Children, pregnant women or those planning to have a baby should avoid eating shark, marlin or swordfish and cut down on tuna as they contain high levels of mercury.
- Other adults including breastfeeding women should have no more than one portion of shark, marlin or swordfish per week.

Storing fish

- Purchase as near as possible to when you are going to consume it as it is highly perishable.
- A blue chopping board should be used for preparing any raw fish.
- It must then be stored at the correct temperature to prevent the action and multiplication of micro-organisms.
- Fish should be stored in the refrigerator between 0-4°C. Keep in an airtight container or on a plate covered with cling film and stored away from other fresh foods in the refrigerator.
- Do not put mussels, oysters or any other live shellfish into airtight containers, because they need to breathe. Place in bowl and put in the coldest part of your fridge.
- For extended shelf life meat needs to be frozen.

DAIRY

Because they are good sources of protein and calcium, milk and dairy products form part of a healthy diet.

Our bodies need protein to work properly and to grow or repair themselves. Calcium helps to keep our bones and teeth strong. The calcium in dairy foods is particularly good for us because our bodies absorb it easily.

Making Healthy Choices

- The total fat content of dairy products can vary a lot. Fat in milk provides calories for young children and also contains essential vitamins such as Vitamins B2 and B12.
- However, much of the fat in milk and dairy foods is saturated fat. For older children and adults, eating too much fat can contribute to excess energy intakes, leading to becoming overweight.
- A diet high in saturated fat can also lead to raised levels of cholesterol in the blood, and this can put you at increased risk of a heart attack or stroke.

Milk

- Choose lower-fat milk.
- Semi-skimmed, 1% fat and skimmed milks contain all the important nutritional benefits of milk, but are lower in fat. Of these options, skimmed milk is the lowest in fat.

Cheese

- Cheese can be high in fat and salt, so it's a good idea to keep track of how much you eat and how often.
- Most cheeses – including Brie, Stilton, Cheddar, Lancashire and Double Gloucester – contain between 20g and 40g of fat per 100g. Foods that contain more than 17.5g of fat per 100g are considered high in fat.
- Some cheeses can also be high in salt (more than 1.5g salt per 100g is considered high). Eating too much salt can contribute to high blood pressure.
- If you're using cheese to flavour a dish or a sauce, you could try using a more strongly flavoured cheese, such as mature cheddar or blue cheese, because then you'll need less.
- Another option is to choose reduced-fat hard cheeses, which usually contain between 10g and 16g of fat per 100g.

- A few cheeses are even lower in fat (3g of fat per 100g or less), including reduced-fat cottage cheese and quark.

Butter

- It is high in saturated fat, so try to use it sparingly.
- Use vegetable margarines as an alternative to butter to reduce the saturated fat content.
- Low-fat spreads can be used instead of butter.

Cream

- It is also high in fat, so use this sparingly too.
- Use plain yoghurt and fromage frais instead of cream, soured cream or crème fraîche in recipes.
- You can also get reduced-fat soured cream and half-fat crème fraîche instead of full-fat versions.

Yoghurts and Fromage Frais

- When eating yoghurts or fromage frais, choose lower-fat varieties, but check that they're not high in added sugar (plain lower-fat yoghurts are a good choice as they usually don't contain added sugars).
- These products contain at least the same amount of protein, calcium and some other vitamins and minerals – such as B vitamins and magnesium – as full-fat versions. They just contain less fat.

Safety, Handling and Storage

- Most milk and cream is pasteurised. If milk is unpasteurised, it is often called raw milk. This must carry a warning saying that it has not been pasteurised and may contain harmful bacteria that can cause food poisoning.
- Children, the unwell, pregnant women and older people are particularly vulnerable to food poisoning and so should not have unpasteurised milk or cream, or dairy products, such as Camembert, Brie and goat's cheese made with unpasteurised milk.
- All dairy products must be handled hygienically and must be properly packaged.
- A white chopping board should be used for preparing any dairy products.
- Dairy products should be stored in the refrigerator between 0-4°C.
- This should be covered and stored at the top of the refrigerator.

Lactose intolerance: Lactose intolerance is a common digestive problem where the body is unable to digest lactose, a type of sugar mainly found in milk and dairy products. Lactose intolerance can cause symptoms such as bloating and diarrhoea.

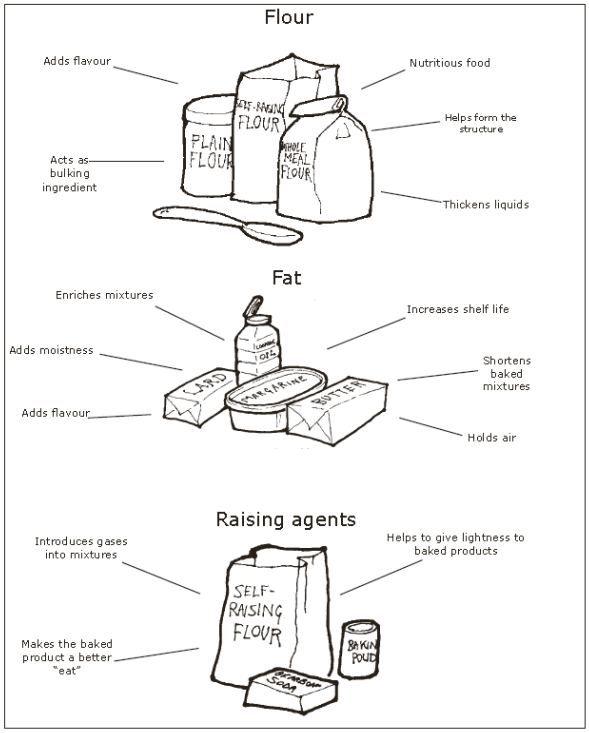
Dairy Alternatives: Unsweetened, calcium-fortified dairy alternatives like soya milks, soya yoghurts and soya cheeses also count as part of this food group and can make good alternatives to dairy products along with newer products such as oat milk, oat cream, rice milk and various nut milks.

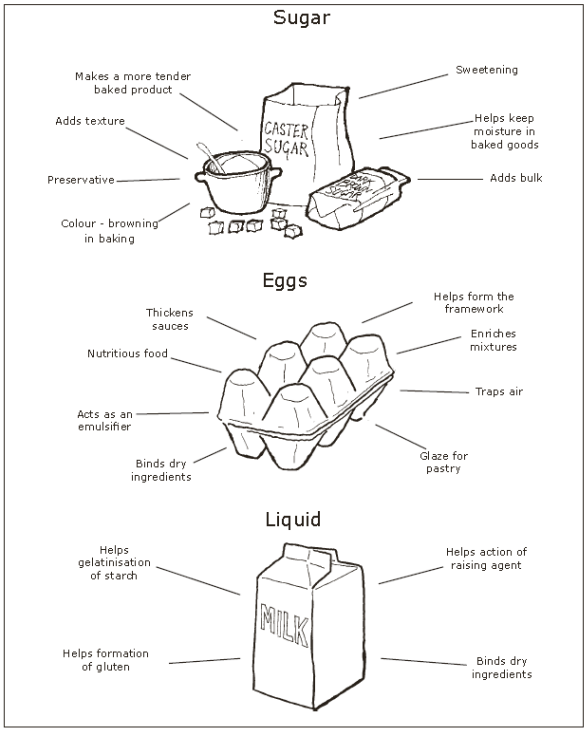
Activity

Other than lactose intolerance explain why someone may choose to use dairy alternatives.

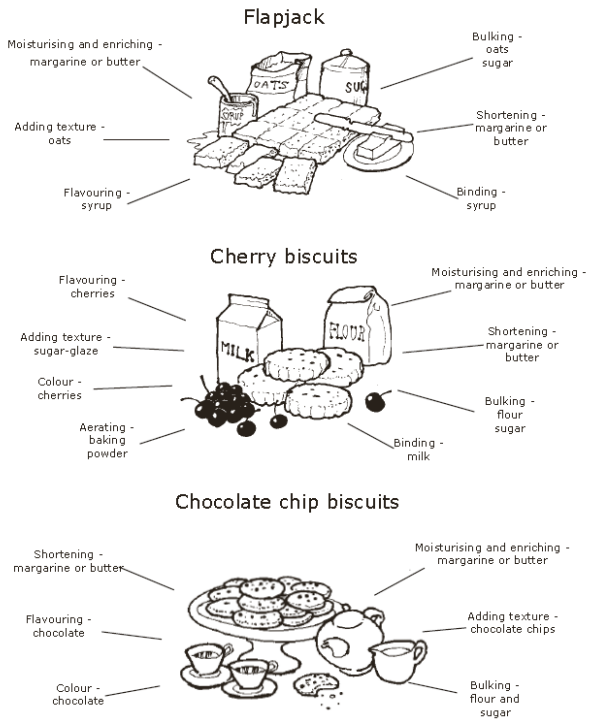
Functions and Characteristics of Ingredients

Why are some ingredients used in recipes? The diagrams below explain the functionality of six main ingredients used in baking.





The ingredients in food products have different functions depending upon how they are used. Below are examples of food products and the functions of the main ingredients



These are the ingredients used in Rock Buns:

200g self-raising flour, 100g butter, 100g sugar, 2 eggs, 50ml milk.

1 Explain the function of each of the ingredients in the Rock Buns.

2 Give one advantage and one disadvantage of using a lower fat spread in making these cakes.

Environment and Ethical Food Issues

Food Miles

Write down a definition of what food miles are:

How far would your pizza travel? In the table below, you need to work out all the ingredients for a basic pizza (using a school recipe) and add any toppings you would have on your ultimate pizza.

Ingredients	Miles to Kingussie

Total miles travelled: _____

How can we reduce the amount of food miles we build up?

Carbon Footprint

Research what a carbon footprint is, and create a poster informing people about their carbon footprint:

Organic

Organic farming could help reduce our worldwide carbon footprint, helping us protect the planet we live on.

You must create a presentation on Organic farming, and the benefits/drawbacks this has. Print off your presentation once complete and place it in your folder.

Locality

In Scotland, we have a climate that suits many different types of crops, from potatoes to wheat. There are mass areas of farmland all over the country, both used for growing crops and also farming animals. Due to having such a vast farming culture, we are fortunate enough to be able to shop locally, this then reduces our food miles.

Not only can we ensure we are buying local ingredients, we can also grow our own crops at home or in allotments. Growing our own vegetables help us save money, this would help reduce our carbon footprint. When we grow our own vegetables, we do not use harsh chemicals to grow these plants – this can help us reduce the environmental impact that farming can have

Reusable

We should try and use reusable or recyclable materials whenever possible when producing food. Recyclable dinnerware may come in the form of China – this can be rewashed and reused on multiple occasions, having the lowest environmental impact whilst being most pleasant for diners. You can also have recyclable dinnerware in the form of compostable items.

Seasonality

Seasonal food refers to the time of year when food is at its best flavour and is grown in the country that offers the best climate for its production. We are fortunate in today's market that we can get any food all throughout the year, however is we can eat depending on the seasons it can help reduce our carbon footprint.

On the map, draw different foods and where they are grown in Scotland:

Now you know where products are grown, you need to create a seasonal calendar. This seasonal calendar should show when foods are harvested throughout the UK.