Food Preparation and Nutrition



REVISION BOOKLET 5 THE SCIENCE OF FOOD

Name: Tutor Group:

Methods for Cutting and Preparing Ingredients Find the meanings of these key terms:					
Slicing	Scissor Snipping				
Peeling	Scooping				
Chopping	Segmenting				
Dicing	Skinning				
Grating	Blanching				
Coring	Blending				
Mashing / Crushing	Juicing				
Shredding	Preparing Garnishes				

	Combining and Shaping Ingredients Find the meanings of these key terms and suggest a dish for each one.					
	Combining		Shaping			
Whisking		By Hand		Binding		
Stirring		In a Mould		Coating		
Folding		Using Cutters				
Creaming		With a Rolling Pin		Glazing		
Rubbing-In		Piping Bag				

Cooking Methods

Cooking food makes it safe, allows it to keep for longer and makes it more palatable. Cooking methods can achieve specific characteristics in food.

Heat Transfer

Heat is transferred by conduction, convection and radiation. Cooking commonly uses a combination of heat transfer methods.

Complete the table below describing the three ways in which heat is transferred through food and give 3 examples of dishes for each.

Conduction	Convection	Radiation
Definition:	Definition:	Definition:
Examples:	Examples:	Examples:
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Methods of Cooking

We cook food to make it easier to digest- animal proteins need to be broken down and plant starches need softening. Cooking adds flavour, makes food look and smell appetising, makes it safe to eat and prevents spoilage.

The main methods of cooking are: in water, in fat and in the oven.

Cooking in Water Match the word to the description.						
BOILING SIMMERING STEAMING POACHING PRESSURE COOKING STEWING BLANCHING BAIN MARIE STEWING BLANCHING BAIN MARIE						
Deep water but small slow pubbles just off the boil. This can protect some water soluble vitamins. Food like dumplings, rice, egg dishes and fruit. Cooking food in their own juices in a covered pan. Long slow method which will tenderise tough cuts of meat such as shin and neck (well used muscles by animals). Deep fast bubbling water can be flavoured. Softens starches, breakdowns proteins but some water soluble vitamins are destroyed or removed. Root vegetables (grown below ground) start in cold water. Water bath that cooks food gently maintaining a low consistent temperature to cook delicate foods like egg custards, crème caramels and crème brulee.						
Short cooking time in boiling water to start the cooking process but prevents colour and nutrient loss. Often cooled quickly ready to be reheated an d finished off quickly maybe during a busy service time.	Perforated conta boiling water or called combinatio steam is forced i without forcin nutrients out, k healthy. Good fo potatoes, fish, ter puddin	ainer sits over special ovens on ovens where n. Cooks food ag any good eeping them or vegetables, nder meats and ngs.	A sealed pan allows pressure to build from expanding gases and liquids which shortens the cooking time.	Gentle cooking in a flavoured liquid off the boil and simmer. Cooks delicate items of fish and egg dishes.		

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Cooking in Fat Match the word to the description.					
SHALLOW FRYING	DEEP FAT FRYING BRAISING	SAUTEING FLAMBEING	STIR FRYING		
Alcohol (brandy, rum etc.) is added to food which is then flamed burning the alcohol off leaving the flavour.	Quick cooking in very little hot oil. Small even cuts of food including meat and vegetables. With little fat and the quick cooking method which does not destroy nutrients make this a popular healthy method.	Food is immersed in hot fat. It must be deep enough to float freely. Delicate food is often protected by a layer which is coated onto the food, such as batter or breadcrumbs which are stuck on by rolling in beaten egg first.	Safety Rules for Deep Fat Frying:		
Vegetables and meat are browned off in hot oil. The vegetables are put at the bottom of an ovenproof dish, meat placed on top and the dish is half filled with stock. Slow cooked in the oven tenderises tough cuts of meat.	Quick method which adds colour to food and the food is normally turned to colour both sides.	Tossing small pieces of food in hot fat which are stirred or tossed around. Ideal for fish, liver, kidney, potatoes and strips of steak.			

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Cooking in the Oven

Match the word to the description.

BAKING	ROASTING	CASSEROLING	MICROWAVING			
GRILLING						
Quick way of cooking or heating up food. Food needs to have a water content. Does not brown the food. Mainly used for defrosting or reheating prepared foods. Does not require fat so can be used for special diet foods.	Cooking and browning with the aid of fat. Very popular method of cooking large joints of meat, which are often served in restaurant carveries.	Cooking meat with intense heat. Quick method of cooking so not too much moisture or goodness is lost from the food. It does not need any extra fat. Expensive cuts of meat are used. Ideal meats are fillet, sirloin and rump. Meat can be marinated first to add moisture and flavour.	Tips for grilling:			
Cooked in dry heat in the oven, giving food colour and a structured texture.	Similar to braising, meat is sealed in a pan on the hob which locks in the flavour. Stock is then added, covered and placed in the oven to cook slowly. This makes the meat tender.					

Protein Keywords

Complete the table below with an overview of the keywords for diet and good health.

Fish		Meat	
Keyword	Definition	Keyword	Definition
Crustacean		Collagen	
Mollusc		Elastin	
Smoking		Myoglobin	
Salting		Muscle Fibre	
Connective Tissue		Maillard Reaction	
Coagulate		Non-Enzymic Browing	
Enrobed		Gelatin	

Meat

Meat is classified as the muscle tissue of dead animals and birds.

Meat is made of muscle cells, which consist of long fibres held together by connective tissue. Long fibres are connected with tough meat- the older the animal, the tougher the meat. Small fibres are associated with tender cuts.

Preparing Tough Cuts of Meat

Muscles that work a lot, such as the thighs and shoulders of animals, give tough meat, e.g. shin and brisket. They will need longer, slowing cooking methods in wet heat, e.g. stewing, braising, pot roasting and casseroling.

Marinades are added to meat before cooking to add flavour and the acid content breaks down the proteins.

Below, mind map different types of marinades and suggest dishes for each:

The Effects of Cooking Meat

The browning of meat is caused by a reaction with natural sugars and proteins to produce a dark colour.

What is this process called?

Checking for readiness:

You should know the safety rules for cooking meats. Explain how to check that meat products are cooked correctly, including key temperatures.

Why can steak be served rare but burgers made from mince should be cooked thoroughly?

What does it mean to tenderise meat? Give examples of ways in which meat can be tenderised.

How should meat be stored safely? Include key temperatures in your answer.

Cuts of Meat

Cuts of meat are prepared by butchers in shops or supermarkets to meet the different needs of consumers.

Today the consumer is looking for meat that:

- Can be used in different ways - Cut into convenient portion sizes - Convenient to prepare - Simple to store - Easy and quick to cook - Low in fat

Suggest a recipe which uses the different cuts of meat in the table below.

Meat Cut	Beef	Lamb	Pork
Boneless Cuts			
Boned and Rolled Meat			
Cubes			
Lean Mince			
Thin Strips			



Types of Fish

Fish can be classified according to their origin.

Fish live in fresh or salt water, have fins and backbones. Shellfish have shells instead of backbones.

Fish can also be classified into oily fish, white fish and shellfish according to their colour, fat content and body type.

Complete the table below with different types of fish and use the key to help subcategorise.

Oily Fish	White Fish	Shellfish	Кеу
			Fresh water
			Salt water
			Round (white fish)
			Flat (white fish)
			Molluscs Small soft bodied sea animals which live inside a soft shell
			Crustaceans Soft bodied, jointed sea animals which are covered by a hard, protective shell

Top Tips for Buying Fresh Fish

Label the image below with what to look for when purchasing fresh fish.









Fish is an important commodity in the diet. List which nutrients are found in fish. Why is it recommended to eat a portion of only fish a week?

Ways of Preserving Fish There are several ways to preserve fish for long term storage .					
		Complete the table below:			
Preservation Method	Definition	Type of Fish	How Long it Keeps For	Recipe Suggestion	
Salting					
Smoking					
Pickling					
Canning					
Drying					
Freezing					

Protein Denaturisation and Coagulation

Proteins are denatured during cooking. Egg proteins coagulate or set when they are heated.

Denaturisation occurs when the structure of amino acids found in protein are altered. They change shape or unfold because chemical bonds are broken. Protein in foods can be denatured (altered) by heat, reduction of pH level (more acid), enzymes and mechanical action. Protein coagulation is a type of denaturation.

Complete the chart below explaining how proteins are denatured via the following actions, include key temperatures where appropriate:

Heat	
рН	
Enzymes	
Mechanical Action	
Coagulation	



Dough and Gluten Formation

	Keywords	Bread dough is mac	le with strong plain fl	our, which contains a h	igh level of protein.
Gliadin		Explain below how enriched dough and pasta are made, and how they differ from basic bread dough.			
Glutenin		Enriched Dough		Pasta	
Gluten					
Carbon Dioxide Gas					
Shortcrust		 Pastries Different type of pastries are used for sweet or savoury dishes. Give a brief description of each type and an example of its use in food preparation. 			
Choux		Shortcrust	Choux	Flaky / Rough Puff	Suet
Ratio					
Rolling Boil					
Heavy Dropping Consistency		Hot Water Crust	Filo	Puff	
Rest					

The Function of Ingredients in Bread Making

Research and explain the function of the key ingredients used in bread making.

Wheat Flour	Liquid	Yeast	Salt	Other Ingredients Used in Bread Making
				Fat
				Sugar
				Sugai
				Ascorbic Acid

The Science of Bread Making				
Research and explain the key stages of bread making and the food science relating to the physical and chemical reactions taking place in the bread.				
Sifting the flour Proving Dough				
Adding warm liquid	'Knocking Back' Proved Dough (then shape and give a final prove)			
Mixing and Kneading Dough	Baking			
l	l			
vhat is the Chorleywood bread making process? Explain the difference between this and the process of bulk fermentation?				

Gelatinisation	Caramelisation	
Definition:	Definition:	Definition:
Scientific Changes that Occur:	Scientific Changes that Occur:	Scientific Changes that Occur:
Examples in Food Preparation:	Examples in Food Preparation:	Examples in Food Preparation
	Circle the correct words in the following passage:	

Sauces

Sauces are either used as part of a dish- for example a pasta bake- or may be served as an accompaniment to a food- for example pepper sauce with a steak.

The main point to consider is how the sauce will compliment the dish.

What can a good sauce add to a food dish?

Complete the table below with examples of dishes that can be improved by adding a good sauce:

Types of Sauces

Complete the table below with the name of each sauce and some examples (sweet and savoury):

BLENDED EMULSIONS	ROUX REDUCTION
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	Dish	Improvement		1	
			Sauce	Description	Examples
Flavour				A combination of fat and flour cooked for a particular length of time depending on the colour of sauce required. Basic ingredients= fat, flour, liquid	
Colour				Milk and cornflour are mixed together and heated until the sauce thickens. There is no fat.	
Moisture				Sauces usually made from meat juices. Boiled to reduce the liquid, to intensify the flavour and to thicken the consistency.	
Nutritional Value				Sauces made with oil and vinegar which are shaken together with an added emulsifying agent to stabilise the mixture.	

Fats and Oils

There are two types of fat- saturated and unsaturated. Saturated fat comes from animal sources, such as butter and lard. Unsaturated fat comes from vegetable sources, such as margarine and vegetable shortening.

Complete the table below detailing the functional and chemical properties of fats and oils.

Shortening	Plasticity	Aeration	Emulsions
Fats make pastry short and	The plasticity of fat allows it to be	Fats can help aeration in baking,	Emulsions are mixtures of liquids
crumbly, and gives colour and	used for rubbing-in, spreading and	the creaming method aerates a	that do not normally mix, e.g. oil
flavour.	creaming.	cake mixture and helps it rise.	and water.
How does fat shorten a Pastry Mixture?	What does plasticity mean?	During preparation of a creamed mixture:	The process of emulsification:
What happens during the cooking	Fats that are solid at room	During baking of a creamed	Examples of emulsifying
of pastry?	temperature and uses:	mixture:	ingredients:
Examples of products that use	Fats that are liquid at room	Examples of products that use the creaming method:	Examples of products made using
shortening:	temperature and uses:		emulsification:

Raising Agents

Raising agents are added to most baked products during the making process using gas, air or steam which, when heated, expands causing the food to swell and rise up. Raising agents produce a risen, light and airy texture in the food. **Unleavened** products don't use a raising agent. Complete the table below describing how the different raising agents work, with examples of baked products for each.

Mechanical Air will expand when heated, incorporated into the product via:	Physical Steam is created in products that contain large amounts of water.	Chemical Most cakes and biscuits need Carbon Dioxide to create the light, airy texture.	Biological: Yeast Yeast is a living organism grown commercially for bread making and alcohol production.
Sieving	Air	Bicarbonate of Soda	
Whisking			
Rubbing-In	Foams	Baking Powder	
Creaming			
Lamination	Steam	Self-Raising Flour	