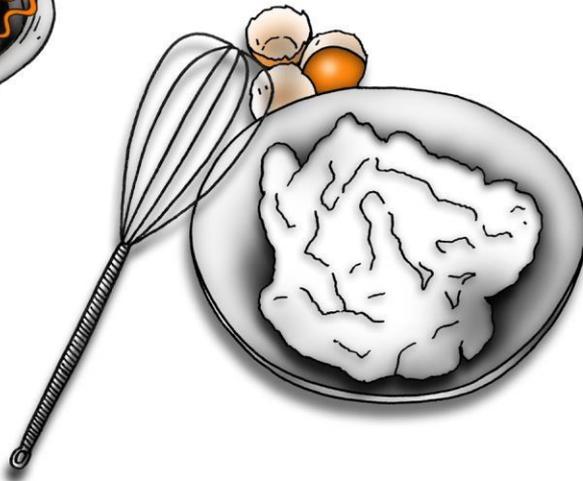




KnowIT FOOD SCIENCE



Cooking of Food

Is it important to cook food?

- Identify 5 reasons why we cook food?
- Can you explain how cooking food improved the texture and give an example?
- Cooking food improves flavour can you explain why.

Chemical Properties of ingredients

Chemical is the science to explain the changes, (how and why different ingredients react and change).

Functional & Chemical Properties of carbohydrate

- Where is starch found?
- Liquid can be thickened with starch, what is the process know as?
- Describe the process starch goes through to thicken a liquid.
- What is dextrinisation?
- Identify 2 food products where dextrinisation occurs?
- What is caramelisation?
- Identify 2 food products where caramelisation occurs?

Heat Transfer

- List the 3 methods of transferring heat to food.
- Can you draw a diagram to illustrate these methods.
- What are the 6 water based methods of cooking food.
- Identify 3 fat based methods of cooking.
- What are the 4 dry methods of cooking.



Functional & Chemical Properties of fats & oils

- What are the chemical structures of fats and oils?
- Define is plasticity?
- What is shortening?
- Define is aeration?
- What is emulsification?
- Identify 2 examples of emulsification in food.
- Identify the emulsification agent used in mayonnaise.

Functional Properties of ingredients

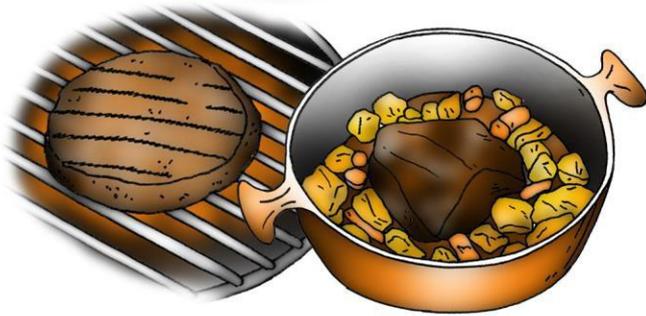
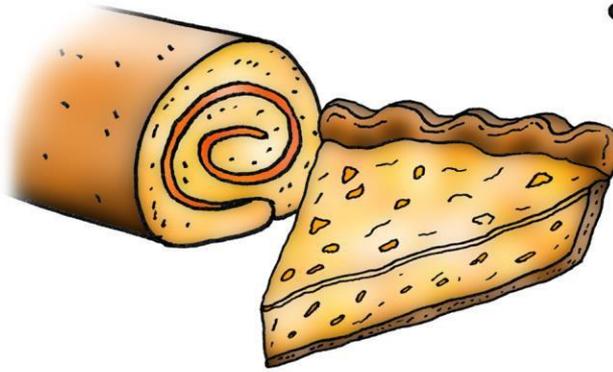
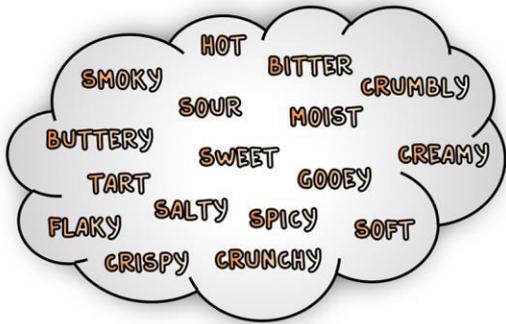
Functional is the how they change food, (what different ingredients do in recipes)

Functional & Chemical Properties of proteins

- What is the chemical structure of protein?
- What is denaturation?
- What is coagulation?
- What is gluten?
- When is gluten formed?
- Why do we use strong plain flour to make bread?
- Why must you knead bread for several minutes?
- Why does a bread rise and then set in the oven?
- What is a foam?
- When is a foam formed?
- How can a foam be stabilised?

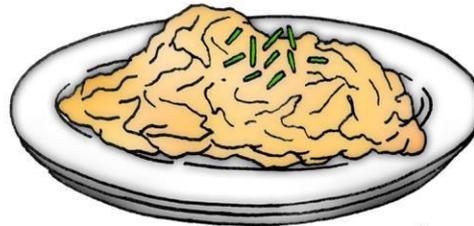
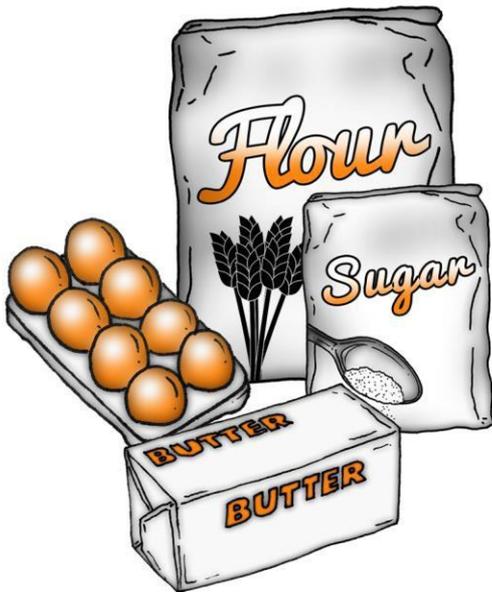
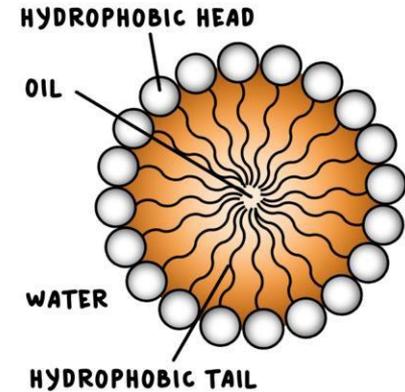
Functional & Chemical Properties of raising agents

- What are the 3 groups of raising agents?
- In which ways is air introduced as a raising agent in food?
- Identify how CO₂ introduced as a raising agent in food?
- In which ways is yeast introduced as a raising agent in food?
- Why do ovens need to be hot for batter to rise?



GraspIT

FOOD SCIENCE



Cooking of Food

Is it important to cook food?

- Discuss why cooking meat in different ways will be beneficial to someone's diet.
- Explain why cooking chicken thoroughly is important.
- Discuss the range of ways fish can be prepared to give variety in the diet.

Heat Transfer

- Explain how a cooker transfers heat energy to food when grilling cheese sandwich and cooking a casserole. Consider how the methods used affect the finished dishes sensory characteristics.
- Discuss the advantages of blanching vegetables, fruit and nuts.
- Boiling and steaming are common methods of cooking carrots. Discuss which of these methods would be better to cook finely diced carrot. Justify your answer.
- Explain how heat is transferred when making a stir fry.
- Discuss the advantages of a fan assisted oven over a gas oven.
- A recipe suggests dry frying minced beef for a cottage pie. Explain why.
- A recipe for roast chicken says to 'place in a preheated oven, and baste chicken every 30 minutes'. Discuss the advantages and disadvantages of roasting and basting the chicken.
- Healthy eating and therefore cooking methods chosen are important in achieving a healthy diet. Explain why stir fried dishes are often healthier than those cooked with other frying methods.

Functional Properties of ingredients

Functional is the how they change food, (what different ingredients do in recipes).

- Explain what the function a flour is in cake, sauce and pastry making.
- Examine the function of fat in cake, sauce and pastry making.
- Explain the function of sugar in cake making.

Chemical Properties of ingredients

Chemical is the science to explain the changes, (how and why different ingredients react and change).

- Explain what the chemical properties of flour is in cake, sauce and pastry making.
- Examine what the chemical properties of fat in cake, sauce and pastry making.
- Explain what the chemical properties of protein in cake, dough and omelette making.



Functional & Chemical Properties of proteins

- Explain why over whisking a foam such as egg white can cause it to collapse.
- Describe what syneresis is using the example of processes of cooking scrambled eggs.
- Explain what happens to cream when you add lemon juice to it.

Functional & Chemical Properties of carbohydrate

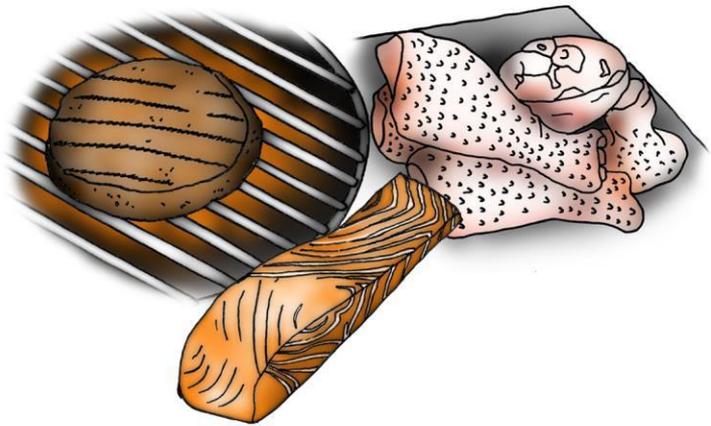
- Analyse why when baking bread the outside of the dough forms a crust and goes brown.
- Discuss why it is important to stir a roux based sauce throughout the cooking process.
- Explain why it is important melt sugar gently with water and not stir to form a caramel sauce.

Functional & Chemical Properties of fats & oils

- Examine why sugar and fat are beaten together during the creaming method.
- Explain why an emulsifier has to be both hydrophilic and hydrophobic.
- Describe to how short gluten molecules are formed during shortcrust pastry making.

Functional & Chemical Properties of raising agents

- Explain the conditions required for yeast in a dough to work effectively.
- Amar is making some cupcakes using the creaming method and is using SR Flour discuss how the cake mixture will be aerated.
- Sadie is making eclairs, the choux pastry is very runny and after baking the eclairs come out flat and have not risen. Explain what has gone wrong.
- Explain how lamination in flaky and puff pastry making the pastry rise in baking.



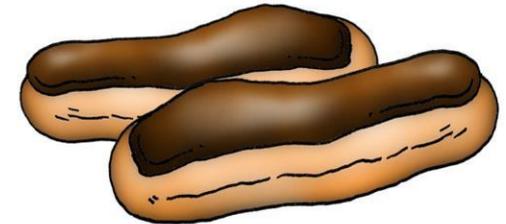
AERATE
FOAMING
COAGULATION
PLASTICITY
DENATURATION
DEXTRINISATION
EMULSIFICATION
CARMELISATION
SHORTENING
GELATINISATION



Fried
VS
Steamed



ThinkIT
FOOD SCIENCE



AERATE *sweeten* COLOUR
add colour CARMELISATION *volume*
DEXTRINISATION *emulsify* BINDS
FLAVOUR *bulk* TEXTURE
coagulates SHORTENS *structure*
INCREASES SHELF LIFE



Cooking of Food:

Is it important to cook food?

- Explain the physical changes that occur to fish when cooking.
- Compare the differences in texture and flavour that can be achieved cooking eggs in a variety of ways.
- Justify why food should be cooked to ensure consumers are safe and boredom is avoided.

Chemical Properties of ingredients:

Chemical is the science to explain the changes.

- Considered what factors have caused pastry in a quiche to be hard and tough when cooked.
- A carrot cake has sunk during cooking explain the possible causes for this.

Functional & Chemical Properties of carbohydrate:

- Discuss the potential issues of not stirring a béchamel sauce continually whilst making.
- Compare how a roux sauce is thickened compared to a blended sauce.
- Consider why controlling the colour of a caramel sauce is important.
- Explain the reason for physical changes that occur during the baking of a sponge cake.

Heat Transfer:

- Discuss the differences in appearance, texture, flavour and nutritive value between fish cooked by deep frying and steaming.
- Consider the changes that occur to a shin of beef whilst cooking a stew. Justify why this method is used to cook this cut of meat.
- Carrots have been boiled are soft, mushy, lack flavour and have lost some colour. Using these observations evaluate the method used and its suitability. Suggest and justify an alternative method to use.



Functional & Chemical Properties of fats & oils:

- Think about what happens to egg white when whisking if it contains some fat e.g. egg yolk in the mixture.
- Consider what happens if you add oil or water too quickly to a stable emulsion.
- Think about how an emulsifier prevents a liquid from separating.
- Compare mayonnaise and a vinaigrette
- Consider why tub margarine has more plasticity than block butter and how this affects its cooking properties. Justify your answer.

Functional Properties of ingredients:

Functional is the how they change food

- Egg in a custard and flour in a béchamel sauce both help to thicken the sauce. Explain the differences between the process in each sauce.
- Compare the choice of fat used to make cakes and pastry, considering their functional properties.

Functional & Chemical Properties of proteins:

- Explain why you would marinate meat and the effects the process has.
- Consider the changes that occur to eggs during meringue making.
- Using your knowledge of ingredients and process consider the factors that caused a loaf of bread to be heavy with a closed texture and pale colour.

Functional & Chemical Properties of raising agents:

- Consider why oil based doughs need an additional raising agent to enable the dough to rise.
- Consider why you would use an alternative raising agent to bicarbonate of soda when making a Victoria sandwich.
- Justify why baking powder is a better raising agent to add to plain flour in baking.