

## Activity 4 -Sauce Making Function of ingredients

### The main functions of sauces are:

- To add liquid to moisten a food or dish.
- To add flavour.
- To add colour.
- To bind ingredients together.
- To add nutrients.
- To make dishes more interesting and appealing.

A wide variety of different sauces can be used to produce dishes using a vast range of skills, to develop differing flavours and textures.

### Function and working characteristics of the main ingredients

#### Scientific explanation

The main ingredients used in sauce making are, flour or thickening agent, fat, liquid and flavourings.

#### Flour

Generally, a soft flour with a low gluten content is used, for example plain flour and cornflour. When flour is mixed with a liquid and heated in a sauce the mixture will thicken.

This is known as **gelatinisation**.

This occurs because:

- the starch grains cannot dissolve in the liquid, so they form a suspension and;
- as the liquid is heated the starch grains swell at **60°C** and as more heat is applied the starch grains break open, causing the mixture to thicken at 80°C. The process of gelatinisation is completed at 100°C.

#### Thickening a liquid with starch



The most common methods for starch based sauce making are:

**Roux method** - flour is stirred into melted fat. Liquid is then carefully added. The sauce is heated and brought to the boil, stirring all the time.



**Blended method** – starch is blended with the liquid. No fat is added. The remaining liquid is heated. The hot liquid is poured onto the cornflour blended mixture stirring carefully.

The sauce is returned to the pan and brought back up to the boil stirring all the time.



**All-in-one** - uses the same ingredients and proportions as the roux method but all ingredients and cold liquid are mixed together in a pan then brought to the boil. Stirring or whisking is required all the time to prevent the sauce from going lumpy.

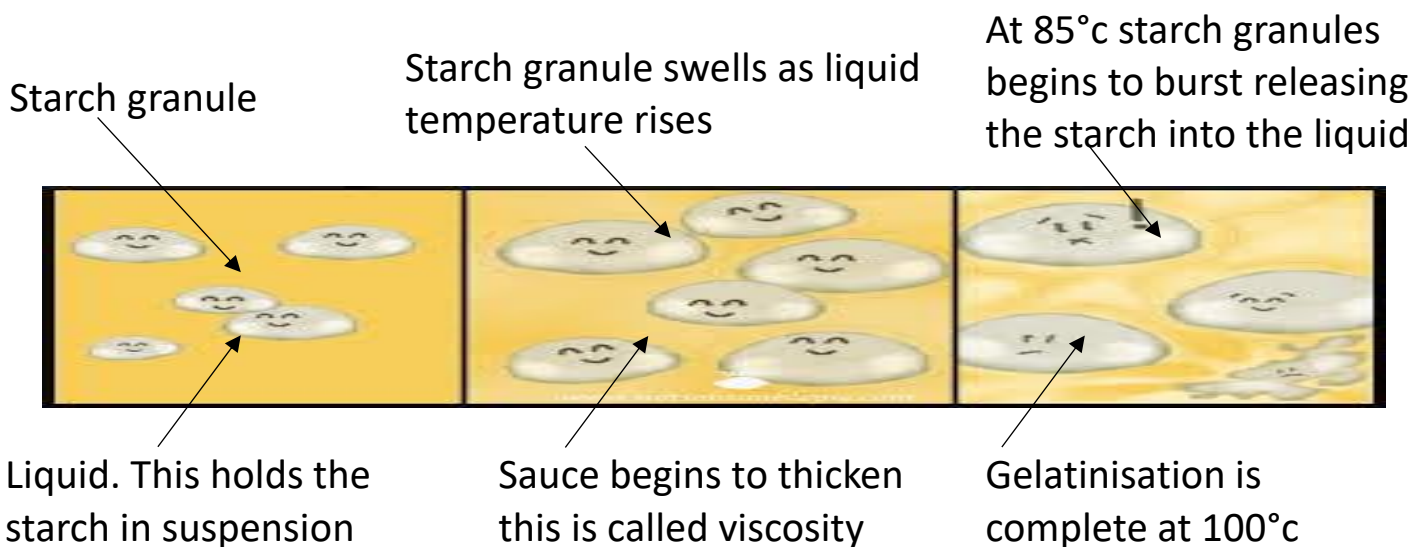
## Technical skill - gelatinisation (scientific explanation)

### (thickening a liquid with a starch when heat is applied)

Starch grains are mixed into a liquid. The starch grains do not dissolve they are suspended in the liquid. This is called a **suspension**. When the starch grains are put in a liquid and then heated, the starch grains will start to absorb the liquid. They will swell and get bigger this will start at **60°C**. This makes the sauce start to thicken, because there is less room for the swollen grains to move around. Stirring helps to keep the starch grains suspended. If the liquid is not stirred, the starch grains will join together and form lumps.

At **80°C** the starch grains are so swollen that they start to burst and release starch molecules into the surrounding liquid. At boiling point **100°C** the sauce completely thickens.

The whole process is known as **gelatinisation**.



### A chart to show the viscosity of white sauces

Different types of sauces use similar ingredients but are combined in different ratios using varied methods to produce a variety of thickness, textures and finishes. Traditionally three thicknesses can be achieved, a pouring sauce, a coating sauce and a binding sauce.

	Proportion of insuedients	Ratio	Method	Outcome
<b>Pouring white sauce</b>	15g plain flour 15g fat 250ml milk	1:1:15	Roux or all in one method	Smooth well flavoured sauce Pours freely
<b>Coating white sauce</b>	25g plain flour 25g fat 250ml milk	1:1:10	Roux or all in one method	Smooth well flavoured sauce, thick enough to coat the back of a spoon
<b>Binding white sauce</b>	50g plain flour 50g fat 250ml milk	1:1:5	Roux or all in one method	Smooth well flavoured sauce Very thick to hold other ingredients or bind them together

## Gelatinisation – Role of ingredients

### How does starch thicken a sauce?

Starch thickens a sauce by a process called **gelatinisation**. When the starch granule is heated with liquid (e.g. water or milk), the granules absorb the liquid at 60°C and swell and the mixture begins to thicken. At 80°C starch granules burst and the viscosity of the sauce increases. Gelatinisation is complete at 100°C.

### Rules for gelatinisation of Starch Flours

*Blending with a separating agent* - starch (flour) must be blended with a separating agent before it is heated, otherwise the starch granules join together to form lumps. The separating agent may be:

- melted fat (e.g. Melted butter in a roux.)
- cold water or another cold liquid such as milk, e.g. sweet and sour sauce.
- other dry ingredients - such as sugar, e.g. custard.

*Stirring* - The product needs to be stirred continually when it is heated, otherwise the starch settles to the base on the saucepan and the sauce becomes lumpy.