

INVESTIGATING FLOURS (Suggested responses)

Method 1

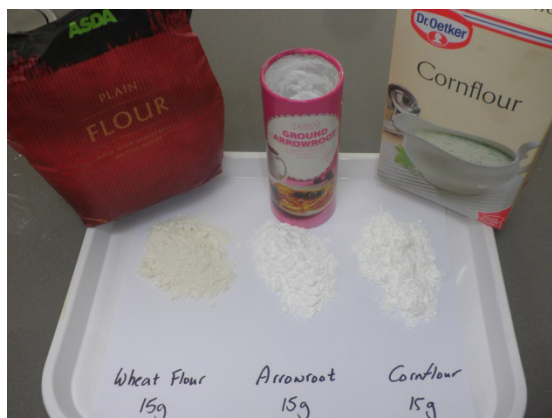
Aim

- Investigating the different flours that can be used as sources of starch for thickening
- Comparing the colour, clarity and stiffness obtained between different starch sources

Equipment

- Digital scales
- Digital timer / stop watch / clock with a second hand
- 3 small bowls
- 3 sticky labels and marker pen
- Pastry brush
- 3 small saucepans
- 3 wooden spoons
- 3 plastic spatulas
- 1 measuring jug
- Viscosity mat
- Ruler

Ingredients



- 15g plain white flour (this is wheat flour)
- 15g cornflour
- 15g arrowroot
- 180ml cold water x 3 (for each starch)

Method

- Write the name of each starch on each sticky label and stick to the outside of your small bowl.
- Using the pastry brush, gently brush the inside of the bowl with cold water
- Place the 15g of the carefully weighed starch into your saucepan and stir in 180ml of cold water with the wooden spoon.
- Observe – what can you see? (the water turns cloudy, it appears that the starch might have dissolved in the water, but in reality a suspension is formed). Each starch forms a cloudy suspension, when I compare the colours between each starch, they are very different.



- Begin to slow heat the starch and water in the saucepan.
- Make sure you stir the starch and water continuously – observe what is happening
- When you start to see the starch thicken, cook for 1 minute, making sure you stir continuously. **DO NOT LEAVE UNATTENDED**
- After 1 minute of stirring transfer the cooked starch into the pre- wetted glass dishes, make sure you scrape all of the thickened starch into the bowl using the plastic spatula. Leave to cool (speed up by refrigerating for about 1 hr)
- *This cooling mix is called a gel. A gel is liquid which is dispersed in a solid (so the liquid in this case is the water and the solid is the starch granules which have swelled).*

Results

You are now going to compare the colour, the clarity and the viscosity of each set gel.
Create a table to record your results:



	Plain white flour (wheat flour)	Cornflour	Arrowroot
Colour	Creamy, yellow white	Almost transparent (see through)	White, cloudy, greyish white
Clarity (is the gel clear or cloudy?)	cloudy	clear	cloudy
Viscosity (how far does the gel spread?)	8.5cm 	11cm 	12.5cm 

Conclusions

Summarise your findings here, consider:

Which gel spreads the least, which gel spreads the most?

The wheataflour spreads the least and the arrowroot spreads the most.

Which starch would you use to thicken a fruit pie filling?

I would use cornflour, this is because it will form a semi-transparent filling. It is flavourless and will give a silky mouth feel.

Which starch would you use to thicken a sauce over a strawberry flan?

I would use arrowroot, because it provides the clearest and glossiest sauce when compared with wheat flour and cornflour. It will enable the user to see the strawberries more clearly due to the sauce being the most transparent.

Which starch would you use to thicken a roux based béchamel sauce? Explain your answer:

I would use wheat flour when making a roux. When making a roux you use equal quantities of fat (such as butter) and wheat flour. Once the fat is melted, the flour is added and stirred in. The starch granules in the flour become coated with the fat. This fat / flour mixture is cooked gently and then liquid (such as milk) is gradually added. The fat that is coating the starch granules helps to keep the starch granules separate when the liquid is added. When cold liquid (such as milk) is added the starch forms a suspension in the cold liquid. When the sauce is returned to the heat it needs to be stirred continuously, this will keep the starch granules dispersed, and prevent lumps from forming. As the temperature continues to rise, the fat will melt and be absorbed by the starch. The starch will gelatinise and you should be left with a smooth and glossy sauce.

What happens if you don't stir continuously when the starch and water are being heated?

Lumps will form – this is because the starch granules will not stay suspended unless the mixture is stirred. Instead they will settle towards the bottom of the saucepan. The starch granules that are in contact with the liquid will gelatinise and this will prevent the liquid swelling the starch remaining.