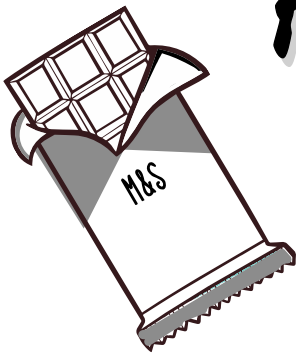




# PROOF OF *the pudding*



## KS4 GCSE Teacher's Notes Lesson 3

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Lesson 1: What do you know about M&S Food? Creating and marketing the Chocolate Melt in the Middle Pudding.

Lesson 2: The science behind the ingredients. Emulsifiers. Modifying the pudding for dietary needs.

**Lesson 3: Make your own ice cream and investigate fat content. Sensory evaluation. What makes a product iconic?**

# Lesson 3



This is Lesson 3 of M&S Proof of the Pudding, a resource made up of three lesson plans.

## Food Technology Learning Objectives

### Lesson 3

- Understand how to set up and conduct a fair sensory evaluation.
- Understand the functional properties and chemical processes of ingredients to achieve a particular result: Fats – modifying fat content.

**Cross-curricular links:** Science, Literacy – developing vocabulary

## Summary

How does an iconic M&S food product come about? Through analysis of our famous Chocolate Melt in the Middle Pudding, students will gain an understanding of what makes a product successful or otherwise. They will develop and apply their own food science knowledge in a series of engaging practical activities including modifying the pudding for dietary requirements and sensory evaluation.

## Resources provided with this pack:

- Lesson 3 Classroom PowerPoint slides
- Film 4: Ice Cream
- Ice Cream Instruction sheet
- Ice Cream Observation Record
- Sensory Evaluation worksheet

Continued overleaf



## You will need (not supplied with this pack):

- M&S Chocolate Melt in the Middle Puddings (sold as a 2 pack – we suggest sharing one pudding between 2 pupils).
- Alternative puddings for students with allergies.
- Spoons and plates
- Access to a microwave
- Someone to prepare the puddings

## For the ice cream activity per group:

- 2 large freezer bags
- 1 small ziplock freezer bag
- Stopwatch/timer
- Tablespoon and ¼ teaspoon measures
- Plates and spoons for serving
- Ice
- 180 ml whole milk OR
- 180 ml skimmed milk
- 4 tbsp sugar
- 6 tbsp salt
- ¼ tsp vanilla essence

## ALLERGENS AND DIETARY REQUIREMENTS

- The puddings do not contain nuts but are **not suitable for people with nut/peanut allergies** due to the manufacturing process.
- Puddings contain **milk, egg, gluten** and **soya**.
- They are suitable for vegetarians.



# Lesson 3 Overview



Activity	Content	Resources
Ice Cream in a bag	Watch the Ice Cream film (film 4) and make your own ice cream in a bag.  <b>ACTIVITY:</b> Make with both full fat and skimmed ice cream to explore the role of fats in foods.	Slides 2-6  Ice cream film, worksheets
Sensory Evaluation	<b>Q: What is sensory evaluation and why is it important?</b>  <b>ACTIVITY:</b> Sensory evaluation at M&S. Students conduct a sensory evaluation of the pudding.	Slides 7-9  Sensory Evaluation worksheet
Plenary	<b>Q: What makes an iconic food product?</b>  <b>ACTIVITY:</b> Mind map all the factors that have contributed to the success of the Chocolate Melt in the Middle Pudding.	Slide 10  Paper and pens

# Lesson 3: Ice Cream in a Bag

Slides  
22-25

## You will need.

- Ice Cream film (film 4), Ice Cream Observation Record, Ice Cream Instruction Sheet
- Per group: 2 large freezer bags, 1 small ziplock freezer bag, stopwatch/timer, tablespoon and  $\frac{1}{4}$  teaspoon measures, ice, 180ml whole milk OR 180ml skimmed milk, 4 tbsp sugar, 6 tbsp salt,  $\frac{1}{4}$  tsp vanilla essence, cups/bowls and spoons for serving

**Students work in small groups** - half the groups use whole milk and half use skimmed milk. Groups swap finished ice creams to allow comparison.

**Explain** we're going to investigate the functional properties of fats. Students make ice cream using two different milks, then compare the results analysing texture, flavour and the time it takes for the mixture to thicken until it coagulates.

**Watch** the Ice Cream film (film 4)



## Instructions

- Put one of the large freezer bags inside the other, then half fill the inner bag with ice.
- Add 6 tablespoons of salt to the ice.
- Put the milk into the small ziplock bag. Add 4 tablespoons of sugar and  $\frac{1}{4}$  teaspoon of vanilla essence.
- Seal the milk bag. Check that the milk bag is sealed.
- Place the milk bag directly on top of the ice. Seal the ice bag.
- Shake the bag until the ice cream is ready, set the timer off and start shaking.
- Don't shake too hard, if the bags split you'll have to start again.
- After 5 minutes pause the timer, stop shaking and see if the mixture has solidified, if it's the texture of soft ice cream then it's ready.
- If it's too runny, start the timer again and keep shaking until it's ready. Remember to pause your timer each time you check.
- Complete the Ice Cream Observation Record – see slide 25 for fat content information.

Continues overleaf

## TOP TIPS

- Aprons and gloves are recommended, this can be a messy activity.
- Using two large freezer bags for the ice is recommended to safeguard against the bag splitting during shaking.
- Keeping one hand on the bottom of the bag when shaking also helps to prevent splitting.
- The ice bags get cold! Working in groups means that students can share the shaking and avoid their hands getting too cold.
- Try to make sure the milk bag stays upright when put into the ice bag, and that it also has contact with plenty of ice.
- Have several spare bags, ice and milk on hand in case of any spills or splits.

## Extension ideas

Students can try making ice cream with other types of milk or milk substitutes and analyse the results.

**Ask** students

**Q: What can you conclude about the effect of fat content on the qualities of ice cream?**

- Answers may include descriptions of texture and flavour.
- Fats are important because they trap air, giving a silky, rich texture to ice cream.
- When skimmed milk is used, it will lack the creamy texture and won't be as light because the air isn't incorporated into it as effectively.

**What's happening inside the bag?**

When ice cream is made, it's simultaneously aerated and frozen. Ice cream contains a lot of air trapped within the fats and that's the reason you need to keep shaking the bag. Air can make up about half of the ice cream's final volume.

As the mixture is cooled, it freezes. If it's frozen quickly, small ice crystals are dispersed throughout the mixture, giving a smooth texture. If it's frozen slowly, these ice crystals can grow and result in an unpleasant crunchy ice cream texture.

**Further information - Why do we add salt to the ice?**

Ice cream can freeze at zero degrees Celsius, but freezes quicker at lower temperatures. When you add salt to an ice cube, briefly, its temperature is above its melting point. As it melts, it cools down as energy is being used to break bonds in the solid state. This salt water has a lower freezing point so the temperature can get colder, freezing the ice cream more effectively. The more salt in the water, the lower the freezing point will be.

# Sensory Evaluation

Ask students;

## Q: What is sensory evaluation and why is it important?

- It is a scientific discipline that analyses how people respond to food products based on the five senses.
- Results of sensory evaluation tests are analysed to ensure products meet the high quality standards set by M&S.

## Sensory Evaluation at M&S

- All food products have a Quality Contract to be followed by the company that supplies M&S. The contract includes details like the product dimensions and how it should look and be labelled.
- Each supplier has a trained Taste Panel Coordinator who oversees taste panels (of 3 or more assessors), and a Controlled Assessment Area, a space with controlled conditions for sensory evaluation.

## Q: What do you think 'controlled conditions' means?

A: Quiet, no smells, natural light, random samples taken from stores and supply chain, controlled procedure for tasting by trained assessors e.g. drinking water to cleanse the palate

- Taste panels score products against the Quality Contract requirements e.g. packaging, appearance, taste and texture.
- All taste panel results are recorded and tracked using a traffic light system. Products are rated either red (fail/reject), amber (borderline) or green (acceptable) for each requirement.



# Sensory Evaluation Test

Slide 29

**You will need:** M&S Chocolate Melt in the Middle Puddings, access to a microwave or oven, plates, spoons, Sensory Evaluation worksheet.

**Explain** that students are going to conduct a sensory evaluation of the Chocolate Melt in the Middle Pudding using a star chart test.

## Why are we using a star chart test?

This test allows us to evaluate the attributes of one product, rather than compare different products.

- Ask students how they will ensure a fair test.
- Prepare the puddings in the microwave or oven following the instructions on the packaging.
- Each student selects 8 attributes to evaluate e.g. chocolate flavour, sauce flavour, soft sponge, odour, sweetness. Students tasting alternative products (for dietary reasons) can select appropriate attributes for their product.
- Taste.
- Record findings on the worksheet.



## Extension ideas

- Evaluate a range of M&S desserts using traffic light ratings (see previous page for details).
- Evaluate a range of melting middle desserts using a different type of sensory evaluation test.

# Plenary

**You will need:** Paper and pens for mind maps

Students work in groups or individually.

The Chocolate Melt in the Middle Pudding has become an iconic product for M&S.

**Q: Can you name any other (non-M&S) iconic food products?**

**Q: What do you think makes a food product iconic?**

**ACTIVITY** Mind map all the factors that have contributed to the success of the Chocolate Melt in the Middle Pudding.

Think about:

- The idea
- How the pudding came about
- The quality of the product
- Appearance and promotion
- Continued appeal



# Resource Evaluation Form

We hope you've enjoyed using this resource. To make sure that we're providing the best resources that we can, we'd be grateful if you could answer the following questions and let us know how we're doing.

**School name:**

**Date you used the resource:**

How did you find out about the resource?

How does this resource link to your classroom activities or planning?

What did you like most about the resource?

What would you change?

Would you recommend the M&S Company Archive resources to colleagues?

Why?

**Thank you for your comments**

Please email your answers to [company.archive@mands.com](mailto:company.archive@mands.com)

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