

Lesson plan: Pasta making and gluten formation

This lesson plan gives you delivery ideas for our GCSE Food preparation and nutrition. The lesson is designed as a one hour session.

The lesson is designed to:

- enhance students' knowledge and understanding of the main ingredients in homemade pasta; the science behind making and cooking pasta to explain gluten formation
- develop students' technical skills with a relevant practical activity
- provide opportunities for stretch and challenge activities to extend teaching and learning
- provide students with practice exam questions to test knowledge and understanding.

You can adapt the lesson plan to the needs of your school, college and students. Practical work can be done individually or as part of a group to reduce costs. A natural follow up activity to further develop technical skills could be to make lasagne, ravioli or cannelloni.

Learning objectives

This will teach students:

- to identify the main ingredients in homemade pasta and explain their functions in the pasta
- to identify the nutritional profile of pasta
- to explain how the type of flour used in pasta affects the gluten formation and the role of kneading to improve the elasticity of the dough
- to demonstrate the skills of making a pasta dough either by hand or in a food processor
- to demonstrate the skills of using a pasta maker to develop the elasticity of the gluten in the pasta, to give the pasta the correct bite and texture
- to explain the effect of heat when cooking fresh pasta in boiling water
- to develop the following food preparation skills: S1, S2, S4, S5, S6 and 10

- to test and evaluate the pasta and produce a nutritional profile for the dish.

Prior knowledge needed

Students will build upon learning from the KS3 cooking and nutrition curriculum. They will further develop their knowledge and understanding of what constitutes a balanced diet and the function of the main nutrients in food. They should already have a good range of practical skills and have made a repertoire of predominantly savoury products which meet current guidelines for a healthy diet.

Lesson preparation

Resources and equipment

Set up the food room in advance with all resources and equipment necessary to make homemade pasta:

- food processors and pasta makers, if available. If not, tools to demonstrate how to make, manipulate and shape pasta by hand.
- PowerPoint presentation
- recipes and instructions to set up and clear away on an interactive whiteboard or at work stations, to encourage independent learning and group work
- ICT facilities for nutritional analysis of the product, if time permits
- the online stopwatch to manage timings and add pace to practical activities.

Activities

Support each lesson with a variety of teaching and learning activities, to include:

- starters, plenaries and opportunities to stretch and challenge
- activities and opportunities to encourage questioning for learning during demonstrations and practical activities
- practice exam questions to test knowledge and understanding.
- time allowed for feedback to students on attainment, progress and reflection on next steps.

You can carry out this investigation as a group with the activities as outlined below or alternatively simplified to making the basic pasta, shaping and cooking it. This will still allow students enough experience to make homemade pasta, understand the principles of gluten formation in pasta doughs and ways to improve the elasticity of pasta for good sensory results.

Lesson 1 Activity plan

Starter Activity

A01, A02, A03 - 5 minutes

Registration, objectives and outline of the lesson. Explain to class they will be carrying out a homemade pasta investigation in groups.

A01, A02, A03 - 10 minutes

Demonstration of homemade pasta making either by hand or using a food processor or pasta maker. Teacher demonstration or show the youtube clip of pasta making. Questioning for learning during demonstration: What is pasta? What ingredients are in pasta? Where did pasta originate from? What do you think is the best flour to use in pasta and why? What nutrients are present in pasta? What is gluten formation? What makes pasta stretchy? The science behind pasta making? Why is pasta a good source of slow release carbohydrates?

Demonstration of pasta making:

1. Weigh the ingredients
2. Mix the eggs and flour
3. Knead and stretching the pasta. Gluten formation by manipulation of the dough
4. Shape the pasta either by hand or in a pasta maker.

Resources:

- PowerPoint presentation
- Recipe for basic homemade pasta
- [How to make pasta from scratch in 5 minutes – youtube video](#)
- [The science of the best fresh pasta – Serouseats website](#)

Main Activity

A01, A02, A03 - 30 minutes

Skills include: general practical skills; knife skills; use of the cooker.

Use of a range of small equipment e.g. pasta maker and food processor

Group work activity:

Investigation 1: What is the best type of flour for making pasta and why?

- a. 00 flour
- b. Strong bread flour
- c. Plain flour
- d. SR flour

e. Gluten free flour

Investigation 2: Is it better to make homemade pasta by hand or using a pasta machine?

Divide the class into groups of 2 or 3 according to size. Give each group an ingredients tray with 100g each of a different flour and 1 egg. As a group, make up pastas as demonstrated.

Group 1: 100gms '00' flour

Group 2: 100gms strong flour

Group 3: 100gms plain flour

Group 4: 100gms SR flour

Group 5: 100gms gluten-free flour

Group 6: '00' flour by hand

Group 7: '00' flour by food processor

Group 8: '00' by pasta maker

This activity can be simplified and the whole class make basic pasta only in groups.

Resources:

- Ingredient trays for investigation work weighed out and measured.
- Small equipment: food processor; pasta maker; small equipment; tasting tubs and spoons
- Simple tomato based sauce or olive oil and fresh basil for sensory testing. (optional)

A01, A02, A03 - 10 minutes

Teacher demonstration: cooking the pasta.

Questioning for learning

What happens to the pasta during cooking? What is the method of heat transference? What is the perfect length of time and best way to cook fresh pasta?

Students to cook pasta for 3 minutes in boiling water and then drain and serve with olive oil and basil or simple classic tomato based sauce.

Resources:

- Equipment needed for water based methods of cooking pasta

A03 - 5 minutes

Washing up, clearing away and presenting pasta and sauce.

A04 - 10 minutes

Group session:

Analysis and evaluation of results. Group discussion: What flour gave the best results for making pasta and why? Is it better to make pasta by hand or using the food processor and why? Is it better to make pasta by hand or in a pasta machine and why? Sensory testing of pasta and recording results on star profile. Record all results as part of conclusion.

Resources:

- Sensory testing equipment and star profile charts to record results
- [Explore food, Food a fact of life website](#)

Further work and reading

Extension - Stretch and challenge activity

1. Using a nutritional programme or food tables, find the nutritional profile of pasta. What macro and micronutrients does pasta contain and why is it such an excellent choice of dish for someone who participates in a lot of sporting activities?
2. Explain why it is important to use the correct type of flour when making pasta and why the choice of flour will affect the gluten formation?
3. Give 5 useful tips for making successful pasta and suggest ways to manipulate the dough to increase its elasticity and texture.
4. What is gluten-free flour and can it be used successfully to make pasta?
5. Discuss the advantages and disadvantages of using fresh pasta as opposed to dried.

Resources:

- [Explore food, food a fact of life website](#)

Homework and preparation for next lesson

Plan a suitable main meal to include pasta that could be served to a competitor in an important sporting event the following day. The meal must be nutritionally balanced, containing both protein and carbohydrate and at least 2-3 portions of their 5 a day. (Lasagne, Cannelloni, Ravioli etc.)

The next lesson could be an extension activity, making up the dish using ready made pasta as an alternative to fresh.

Analyse and evaluate the results of the pasta investigation carried out in the lesson and write up a detailed conclusion.

- What were the results of using the different flours for pasta making?
- Which type of flour was the best and why?
- What were the advantages and disadvantages of making pasta by hand and using a pasta maker?
- Why is it important to stretch and manipulate the dough at different settings in the pasta maker?
- Which pasta had the best sensory results?
- What conclusions can be drawn from the results of the investigation
- How can the results be applied to the practical task of making homemade pasta?