Title	**FOOD PRESERVATION**	**Class**	2nd Year, Secondary school (13 year old students)
Subject(s) involved	TECHNOLOGY	**Number of lessons**	**8**
Teaching aims	PROVIDE INFORMATION ABOUT HEALTHY FOOD PRESERVATION. LET PUPILS DIRECTLY EXPERIENCE OUTCOMES OF A WRONG FOOD PRESERVATION METHOD.		
Learning outcomes	What learners will be able **to know** by the end of the unit	*Learners will be able to know about* *DIFFERENT TYPES OF BACTERIA AND INFORMATION ABOUT THEIR GROWTH* *MAIN PRESERVATION METHODS AND STOCKAGE HABITS.* *LOUIS PASTEUR AND HIS SCIENTIFIC FINDINGS*	
	What learners will be able **to do** by the end of the unit	*Learners will be able to* *UNDERSTAND THE TERMS FOOD-SPOILAGE AND FOOD STORAGE* *DO AN EXPERIMENT TO UNDERSTAND THE MAJOR FACTORS THAT EFFECT FOOD PRESERVATION-* *SORT OUT IN WHICH ENVIRONMENTAL CONDITIONS SOME FOOD CAN BE BETTER PRESERVED* *WORK IN GROUPS TO CARRY OUT SPECIFIC TASKS* *READ FOOD LABELS CORRECTLY*	
	What learners will be able to **be aware of** by the end of the unit	*Learners will be able to be aware of* *FOOD PRESERVATION IS NECESSARY TO MAINTAIN HUMAN LIFE.* *CONDITIONS WHICH CONTRIBUTE TO MICROBE GROWTH* *CONTROLLING MICROBES AND ENZYMATIC ACTIVITY ARE THE GOALS OF A VARIETY OF PRESERVATION TECHNIQUES. (If these techniques are not used, physical, chemical, and biological deterioration are possible).*	
Content	CLIL theme with possible crosscurricular links	FOOD PRESERVATION , FOOD SAFETY	

Communication	Language **of** learning	Vocabulary: PRESERVATION METHODS, SPOILAGE, MICROBE, BACTERIA, GERMOMETER, MOLD ecc. Structures: Present Simple Functions: PROVIDE SCIENTIFIC EVIDENCE ABOUT DIFFERENT TYPES OF FOOD DETERIORATION BY REFERRING TO ENVIRONMENTAL CONDITIONS AND FOOD PROPERTIES. PRESENT THE OUTCOMES OF A SIMPLE SCIENTIFIC EXPERIMENT.
	Language **for** learning	Vocabulary. ……. I DIDN'T KNOW THAT, THIS INFORMATION IS NEW / INTERESTING,…. I ALREADY KNEW THAT, ENVIRONMENTAL CONDITIONS (LIGHT, WATER, TEMPERATURE, PH,…), ecc. Structures: WHY-AND WHAT-QUESTIONS AND CORRISPONDING ANSWER-FORM… Functions: SIMPLE PAST
Cognition	Thinking skills development (LOTS and HOTS)	• UNDERSTAND THE TERMS FOOD SPOILAGE AND FOOD STORAGE. • DESCRIBE OUTCOMES FROM A SIMPLE SCIENTIFIC EXPERIMENT. • INFER INFORMATION ABOUT THE MOST PROPER ENVIRONMENTAL CONDITIONS FOR PRESERVATION OF A SPECIFIC FOOD FROM THE EXPERIMENT DONE. • FIND KEYWORDS • BECOME AWARE OF THE CONTRIBUTION OF SCIENTIFIC FINDINGS ON HUMAN LIFE QUALITY.
Culture	Awareness of topic relevance to daily life	Food preservation adds variety in the diet, increases shelf life and helps to avoid food wastage. Food preservation is necessary to maintain human life. We preserve food for human safety, quality enhancement, convenience, and to maintain an adequate supply. Food storage methods are other major factors that effect food quality.
Materials and resources	PC CONNECTED TO INTERNET AND WITH SPEAKERS TO WATCH YOUTUBE VIDEOS, WHITEBOARD, POWER POINT PRESENTATIONS, EXPERIMENT MATERIALS (SOME GLASS TUBES OR PETRI CAPS, FOOD LABELS , COOKED – BOILED AND DRAINED RICE, REFRIGERATOR AND COTTON WOOL), PHOTOCOPIES https://www.youtube.com/watch?v=7D0eIsuZC3w	

	https://www.youtube.com/watch?v=OXdbQ1JkX7cHREE
Assessment	Formative: SCIENTIFIC REPORT AS THE FINAL PRODUCT OF THE WORK IN GROUPS, DIAGRAM TO BE FILLED IN WITH INFORMATION DEDUCTED FROM VIDEO AND PHOTOCOPIES AVAILABLE. Summative: written and oral tests (MULTIPLE CHOICE, GAP FILLING EXERCISES, …)

Each Learning unit will be divided in single lessons. The steps to follow during the learning unit are the following:

- ACTIVATION
- FIND OUT (INPUT)
- SORT OUT (INPUT PROCESSING)
- OUTPUT (SPEAKING AND WRITING TO PRESENT THE NEW PRODUCT/INDIVIDUAL/GROUPWORK)
- ASSESSMENT (SUMMATIVE ASSESSMENT OF THE UNIT)

These steps will be developed during a certain number of lessons each teacher will plan.

LESSON PLAN

Lesson 1 **Title : WHY DOES FOOD PERISH?**

Timing 1 h

Activation of the unit	**Discussion:** The title of the learning unit (CLIL project) is "FOOD PRESERVATION". What does it mean? In your opinion, why does the food perish? Can we preserve food from spoilage? How? What are the factors that affect the microbial growth? Which methods can we use?	**Interactional Pattern***** **I** **(Teacher→Students→Teacher)**	**Resources and Materials**
Core activities **Find out (input)**	The students watch a power point presentation, they observe pictures and are asked some questions by the teacher to describe what they see in order to improve understanding.	**W** **I**	File: food conservation 1 Attachment 1

LESSON PLAN

Lesson 2 **Title: THE GERMOMETER**

Timing: 1h

Lead in of the lesson (warm up)	Brainstorming ideas/ words associated with food spoilage, mold, microbes, food and health. Teacher asks: *what are the bacteria, and germs? What are the favorable conditions for their growth?*	**Interactional Pattern*** **I (Teacher→Students→Teacher)**	**Resources and Materials**
Core activities (input processing)	Students watch some slides about germometer and a video about bacteria. Students work on the 5th slide of the presentation (att. 2), first in pairs, then in little groups, finally the whole class compares the answers**.** TEST – all 2 Finally the teacher provides instructions on material to be brought by Students the following lesson in order to run an experiment.	**T→Sts** **Ss in pairs, in small groups and Ss→ T** **W** **G** **P**	whiteboard File: CLIL technology 2 Germometer attachment 2 TEST Attachment 2 https://www.youtube.com/watch?v=7D0eIsuZC3w

LESSON PLAN

Lesson 3 **Title: THE NECESSARY CONDITIONS FOR THE GROWTH OF MICROBES.**

Timing: 1.30 h

Lead in of the lesson (warm up)	Discuss: What conditions do microbes need in order to make our food go 'off' or 'bad'?	**Interactional Pattern***	**Resources and Materials**
Core activities	*EXPERIMENT WITH RICE:* *ACTIVITY 1 (GROUPS OF 3 OR 4 STUDENTS - Classroom)* The teacher explains how to prepare Petri dishes with rice cooked and uncooked in several conditions (in refrigerator, covered with oil, at room temperature, etc.) and to observe them for two weeks. The students note the observations on the tables as from slide 4th. They look for the growth of mould in the tubes. Decide what the conditions were like in each tube during the experiment.		PPT activity two. Attachment 3 Glass tubes or Petri dishes, rice cooked and uncooked, gloves, oil, cotton wool, refrigerator. Photocopy of the 4th slide

LESSON PLAN

Lesson 4 **Title : PREPARE A SCIENTIFIC REPORT**

Timing: 1 h

Sort out and warm up	Students look for the growth of mould in the tubes, decide what the conditions were like in each tube during the experiment. The students make the observations and complete the specific table with accurate notes. Then, in pairs, respond to the questions proposed in the 5th slide of PPT – attachment 3 Finally the whole class compares the answers.	**Interactional Pattern** Ss in pairs Ss→T	**Resources and Materials** PPT activity two. Attachment 3
Output (speaking)	Students are invited to comment on the experiment results: what did they see in Petri dishes with rice samples? Did mould growth occur in all specimen? Under what conditions did the mould fail?	I P W	Notebook, photocopies.

Lesson 5 **Title : METHODS OF FOOD PRESERVATION**

Timing: 1.30 h

Lead in of the lesson (warm up)	BRAINSTORMING How many ways can you think of to preserve raw food? What would you do if you had no electricity available?	**Interactional Pattern** T→Ss→T	**Resources and Materials** Exercisebook
Find out	The students watch the first 7 slides about methods of food preservation.	***T→Ss→T***	METHODS OF FOOD PRESERVATION PPT presentation ACTIVITY ATTACHMENT 4 https://www.youtube.com/watch?v=OXdbQ1JkX7cHREE

	Then they watch a video specifically about pasteurization. The teacher elicits some key information presented. Afterwards they read a biography of Louis Pasteur (slide 6).		

LESSON PLAN

Lesson 6 **Title : METHODS OF FOOD PRESERVATION**

Timing: 1.30 h

Lead in of the lesson (warm up)	The teacher presents the topic of the lesson showing some foods preserved in different ways: dehydrated fruit, vegetables in oil, fish under salt, fruit jam, ecc…and asks the students: "Which preservation methods can you recollect from the previous lesson?" "Which other ways can you infer by looking at this food?"	**Interactional Pattern*** ***T→Ss→T***	**Resources and Materials** Products (food)
Sort out	The students watch the slides that show the main methods of food preservation. The students work at worksheet PRESERVATION METHOD TABLE The teacher recalls the main ideas by asking the class to help.	W G	PPT ACTIVITY THREE Attachements 4- 5

LESSON PLAN

Lesson 7 **Title : READING NUTRITION LABELS AND LABEL DESIGNING**

Timing: 1.30 h

Lead in of the lesson (warm up)	The teacher asks which main information a label contains	**Interactional Pattern** ***T→Ss→T***	**Resources and Materials**
Find out	The teacher shows some labels and asks the students to analyze the features.	***T→Ss→T***	Labels
Output (product)	The teacher provides following instructions: students have to design a label to stick on the jam jars. It has to show each piece of the following information: • brand • product name • ingredients • Instructions for use • nutritional information • expiry date. The labels can be made either by hand or by computer at: https://www.getpaint.net/	T→Ss	Computers with Internet connection colored pencils, sheets, glass jars.

LESSON PLAN

Lesson 8 **Title : FINDING MISTAKES**

Timing: 1 h

Lead in of the lesson (warm up)	The teacher asks Students which preservation methods were already used in ancient times	**Interactional Pattern*** ***T→Ss→T***	**Resources and Materials**
Sort out	READ AND UNDERSTAND TEXT: *"HISTORY OF FERMENTATION AND ITS BENEFITS"*		Photocopies of the text
Output	Students work in pairs reading the text, discussing together to try to understand it. In the end, individually, they respond to the T/F test.	P	PHOTOCOPY OF THE TEXT Attachement.6 TRUE OR FALSE

Assessment	*Written test FINAL TEST.PDF (gap filling, multiple choice)*

Whole class: W, groupwork: G, pairwork: P, individual work: I