

FOOD PRESERVATION SKILL MANUAL GRADE VIII



Central Board of Secondary Education
Shiksha Kendra, 2, Community Centre, Preet Vihar, Delhi - 110092

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Foreword

With an aim to overcome the social status hierarchy associated with Skill (Vocational) Education, the NEP 2020 has recommended integration of Skill Education Programme in mainstream education in all the educational institutions and exposing students at early ages to quality Skill Education through the middle and secondary school and smooth integration into higher education/vocation.

The world of academia has an important responsibility to meet the requirements of the practical world and prepare students with the knowledge and skills that they require to adapt to the new world order. In this direction, it is prudent to expose them to such concepts early on their educational journey.

We would like to congratulate Mrs. Sharmila Raheja (Principal, Uttam School For Girls), Princess Diya Kumari Foundation for their constant support to accomplish the project successfully. We would also like to thank all members of team who worked towards completion of this manual.

Due care has been taken to keep the book content simple and easy to understand. The progression of topics too is carefully designed as it transitions from the most fundamental concepts of Food Preservation in a guided manner.

We sincerely hope that the handbook is well received by the students, and they can leverage the learnings provided therein. Any suggestions for the improvement of the book are welcome.



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Topic 1: Introduction to Food Preservation

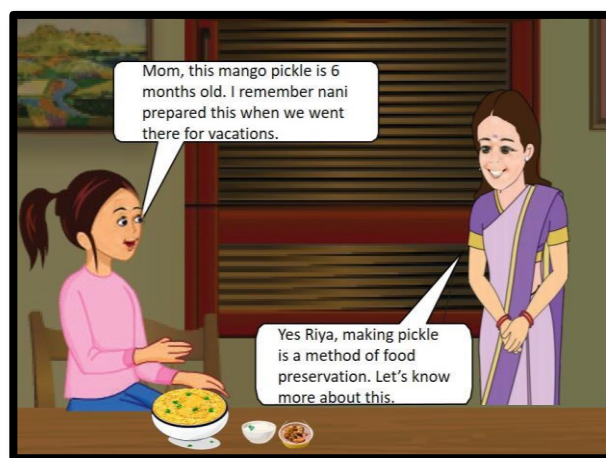
Learning Objectives:

- To enable students to appreciate and understand the methods of food preservation.
- To check prior knowledge about food preservation of students and to build up further learning.
- To facilitate students to research about the common food products which are preserved.

Learning outcomes:

Students will be able to observe:

- Emergence, objective, and requirement of preservation.
- Equate prior knowledge and expand their learning about food preservation.



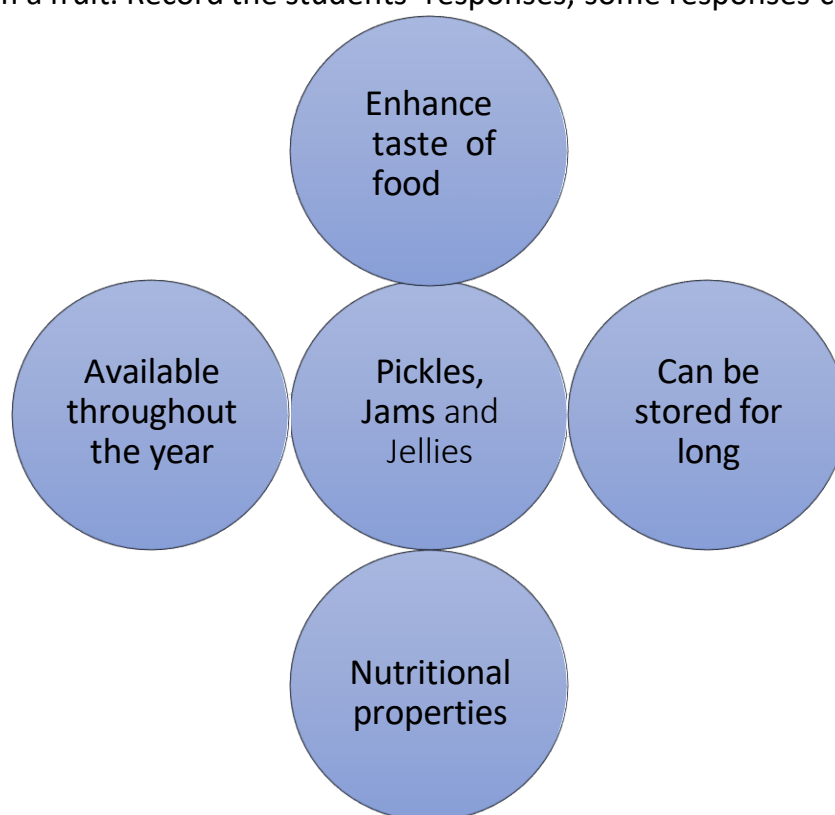
- Riya, a class 8th student while eating mango pickle wondered how pickles do not get spoiled and stay same for months or years.

1A. Starter Activity: “If Pickles Could Talk”

- This fictional activity introduces the students to the topic. Students will give clues about their favourite pickle, jam or jelly and rest of the students will guess the food item being talked about.
- Post activity students will be asked as to why a particular jam, jelly or pickle is their favourite .

Purpose?

- Students will be asked to think of the reason behind pickling a particular vegetable or making jam/ jellies from a fruit. Record the students’ responses, some responses could be:



Pickling is one of the oldest methods of preserving food. It is the process of preserving food by either anaerobic fermentation in absence of air or immersion in vinegar, oil, salt, and sugar. The resulting product is called a pickle. This method imparts a special flavour to food or when mixed with other foods.

Similarly, fruits are preserved by making jams and jellies to make them available throughout the year.

1B. Common Methods of preserving food in our household.

- Let us discuss some common methods of preserving food in our household. Let us take the example of the king of fruits – the Mango! This juicy fruit is grown in India in the summer months, typically from April to August. Over 24 varieties of mango are grown in various parts of our country. It is a versatile fruit and some of the food items which are made with mangoes are mango juice or squash, mango jam, mango pickle, aam papad, mango pulp, mango chutney, and many more.
- Why do we boil milk or keep fresh fruits and vegetables in the refrigerator, sun dry various items like papads, and wadis, or store rice and pulses in airtight containers? The main motive behind these practices is to increase the shelf life of food.
- To sum it up, food preservation is practiced to keep the food safe, maintain its quality, and prevent spoilage. Therefore, food preservation is the process of preventing food from getting spoilt while retaining its qualities.





Activity Time

1. Look around your house and observe. Can you name some food items that spoil quickly and some which do not get spoilt for a long time?

S.No	Stay fresh for long	Spoiled easily

1C. Why do we need to preserve food?

- The nutrients such as carbohydrates, protein, vitamins, minerals, and fats from healthy food help us grow, fight diseases, and maintain healthy body functions, like studying, playing, and thinking.
- In older times our ancestors developed various methods of making seasonal food items available throughout the year and preventing their spoilage by inhibiting the growth of microorganisms. This was a scientific process that will be discussed further.
- Preserving food items also helps prevent the wastage of food, by pickling the excess produce. We are aware of the importance of food for life, but we can also not overlook the amount of food waste – it is beyond our imagination. For example, India wastes 67 million tonnes of food every year, the value of which is approximately 92,000 crores. Imagine if we add food wastage for all fast-developing developed countries! The above facts must have made us think as what is the need for preserving food. (data from [World Food Day 2020: How food waste affects the economy | Business News \(timesnownews.com\)](https://www.timesnownews.com/business-news/story/world-food-day-2020-how-food-waste-affects-the-economy/711111))
- Food preservation allows items to become available to places where they are not grown locally. For example, in places that have harsh weather conditions like desert areas and in Himalayan regions which are covered with snow most of the time, very few food items can be grown. Therefore, preserved food items can be made available to those regions.



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Activity Time

1. Try to research about the common food products which are preserved in and outside your region. You can use a Google Form/Microsoft Form and share it with your friends, relatives to collect the data and discuss your findings graphically(Pie chart)



Check your understanding

1. The main reason for preserving food is to:
 - a) improve its colour and taste
 - b) increase its shelf lie
 - c) make costly food available
 - d) change its texture
2. Preservation of food means:
 - a) to keep food safe
 - b) to retain the quality of food
 - c) to prevent decomposition of food
 - d) all the above
3. Shelf life of food is related to:
 - a) freshness of food
 - b) quality of food
 - c) decomposition of food
 - d) time limit for which food can be used

I hope , you have now understood what is food preservation.



Topic 2: Common methods of Preservation

Learning Objectives:

- Students will be able to describe the need to preserve food.
- Students will be able to list various methods of food preservation.
- Students will be able to understand the impact of geographical location on the local food preservation techniques/items preserved.

Learning Outcomes:

At the end of the unit, students should be able to:

- Highlight the need for food preservation.
- Describe the methods of food preservation.
- To demonstrate understanding of traditional vs new methods of food preservation.



Riya now wonders and asks her mother whether pickling is the only method to preserve food.

2A. Check for prior knowledge or prior research

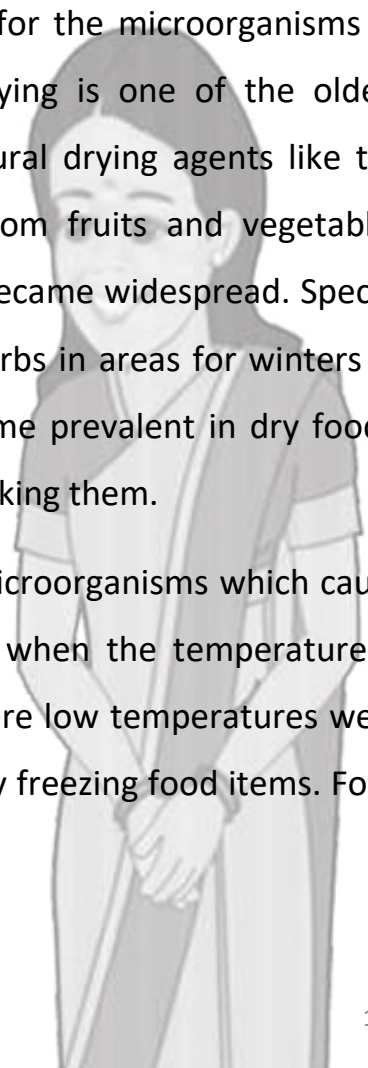
Share about the common food products which are preserved.

2B. Introduction

- The search and use of methods of food preservation can be tracked back to early human civilization. To survive, ancient man had to harness nature: in frigid areas, animal meat was frozen on ice, and in tropical areas, food was dried in the sun. People living in cold regions used to struggle to ensure food supply, especially during the winter months. They started preserving fruits and vegetables to maintain the food supply during seasons when no fresh fruits and vegetables were available. Dehydration (drying) being used as a method of food preservation can be traced back to thousands of years.

2C. Primitive/Traditional methods of Food Preservation

- **Drying:** The presence of moisture is an important factor for the microorganisms to grow in order for the food to get spoilt. Therefore, drying is one of the oldest techniques to prevent food spoilage. In olden times, natural drying agents like the sun's heat and wind were used to remove moisture from fruits and vegetables naturally. With the progression of time and use of drying became widespread. Special rooms were created to dry fruits, vegetables, and even herbs in areas for winters or when there was less sunlight. A fire use of fire also became prevalent in dry foods, which served a dual purpose of drying them along with smoking them.
- **Freezing:** Freezing is an effective technique because the microorganisms which cause food spoilage are killed or are not able to grow quickly when the temperature is lowered. This method was used widely in cold regions where low temperatures were used to preserve food. The storage times were increased by freezing food items. Food was preserved in cold cellars or caves.



Curing: This method was primarily used to cure meats using salt or sugar. Salt and sugar act as preservatives removing the moisture from the food item thus controlling the growth of microorganisms. Curing was very popular prior to the invention of refrigerators. However, its roots are tied to various cultures that use this method to date. For years this method made fish and meat available to the diets of soldiers and marines. However, curing is not limited to meats only, have you eaten amla murabba, any fruit in sugar/ honey syrup, or candied orange peels? The use of sugar to cure food items is reserved mostly for fruits.

Fermenting: The history of this method of food preservation may be as old as mankind itself. To date, every culture has its own recipes which use this process. We have a variety of food items that use this method, some examples are idli, dhokla, naan, kulcha, chaas, and kanji to name a few. However, the scientific discovery of this method dates back to the 19th Century when French chemist and microbiologist Louis Pasteur used this term. He noticed how yeast brings about changes when they grow in the absence of air. It is a valuable food preservation method as it is not limited to household purposes but is used widely commercially in the production of alcohol and vinegar. This is a chemical reaction where microbes convert natural sugar present in grains and fruits to alcohol along with the release of carbon dioxide gas. But, these are not the only end products, several other edible food and drink products, are also prepared using this method as discussed above.

Pickling: The use of oil, salt, sugar, vinegar, and spices while making pickles creates an environment that doesn't allow the microorganisms to spoil the food. Now you must know how the sour and spicy mango pickle stays fresh for months. Or the tangy lemon pickle? This method is used to date to preserve vegetables, herbs, and fruits.



Riya is now curious to know more about food preservation techniques. So, her mother tells her about modern methods of preserving food.

2D. Modern methods for Food Preservation

The following are the main modern methods for the preservation of foods:

Pasteurization- Have you ever wondered how the milk delivered to us in packets has a longer shelf life as compared to the one we get from the milkman? In this method, the food product is heated (mostly milk) to a temperature that kills the microbes. Milk is heated to 63°C - 65°C for about 30 minutes and is then rapidly cooled killing the microbes. This method has revolutionized the dairy industry by increasing the shelf life of milk.

Freeze drying- This is like dehydrating the food item but is a modern technique where moisture is removed using low (freezing) temperatures using a vacuum.

Vacuum packing- Have you seen dry fruits in vacuum packing or a pop sound when you open a jar of jam? Here, the air is removed from the container by using a vacuum pump before sealing the bag. The microbes are unable to grow in the absence of air. This method is widely used to pack nuts and dry fruits as it helps to keep them fresh for a long time by preventing them from oxidizing.

Chemicals as food preservatives – As the name suggests, chemicals are used in this method to preserve food items. Some of the commonly used chemicals are benzoic acid, sodium benzoate, and nitrates). These chemicals are used in very small quantities as they have harmful effects. This has caused a debate about the use of chemical preservatives in processed food items.

Scientific advancement and innovations have led to the introduction of various new methods and improvements in the existing ones. Food preservation is a widely researched method due to its large commercial implications.



Activity Time

1. *I am a* _____

Choose a food product that has been preserved by using a traditional and modern method of preservation (say Amla has been preserved by drying and also by using chemical preservatives). Let's assume you are the preserved version of the product using traditional method while your friend is the preserved version using modern methods of the same product.

Create a short conversation enlisting the advantages/disadvantages of preservation by traditional vs modern methods.



Check your understanding

1. Classify the following methods of food preservation as traditional or modern methods of food preservation.

Salting, Curing, Vacuum packing, Drying, Chemical preservatives

2. Which of the following is not a household technique of food preservation?

- a) Smoking
- b) Dehydration
- c) Salting
- d) Freeze drying

3. Which of the following is NOT a reason for food preservation?

- a) To prevent spoilage of food
- b) To grow more food
- c) consume food products that are seasonal
- d) To prevent the growth of bacteria and microorganisms in the food

4. Following is the list of food products that can be preserved. Which method/ process would you suggest to preserve them?

- a) Mango
- b) Milk
- c) Cabbage
- d) Carrot

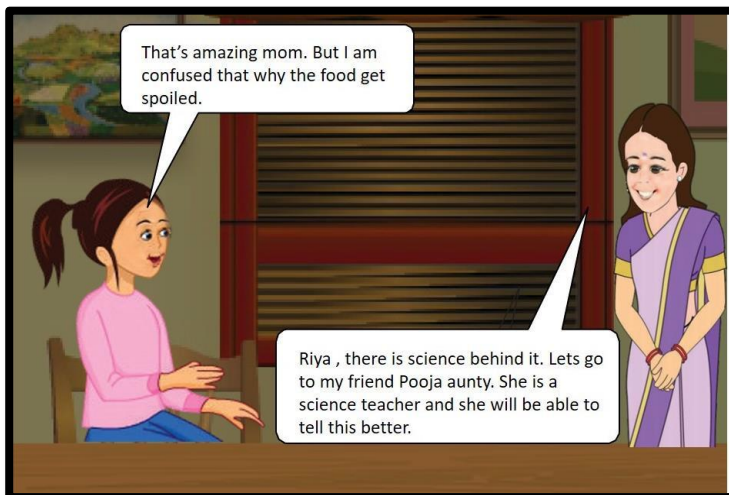
Chapter 3: Principles of Food Preservation

Learning Objectives:

- To gain knowledge about various food preservation techniques.
- Understand the role of microorganisms in food preservation and their interdependence.

Learning Outcomes:

- At the end of the unit, students should be able to list various methods of preserving food and correlate microorganisms and food preservation.



Ms. Pooja explains the reasons behind the spoiling of food to Riya.

Topic 3: Principles of Food Preservation

1. : Microorganisms and food

- Have you ever wondered where the white, green or black spongy growth appears from if you leave your lunch box in school in summer? This growth is called mould. Does the smell of leftover food change? Is it safe to eat that food? The food is not suitable for consumption as it is spoilt due to the growth of mould or fungus.
- What happens to the cooked vegetables or curries if we do not keep them in the refrigerator in summer? We can observe a bad smell being emitted and the appearance of bubbles. The dal and vegetables are now spoilt and are not safe for consumption, the food items once spoilt are no longer fit for consumption and may cause food poisoning.
- How do we come to know that the food is spoilt? If it changes colour, emits a strange or foul odour, there is frothing or bubbles on the surface of food, or there is a visible growth of mould. You would have also observed the formation of brown spots on fruits and vegetables, it also indicates food spoilage.

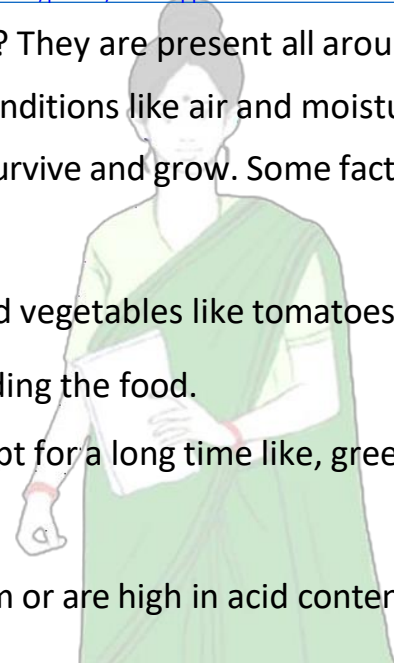


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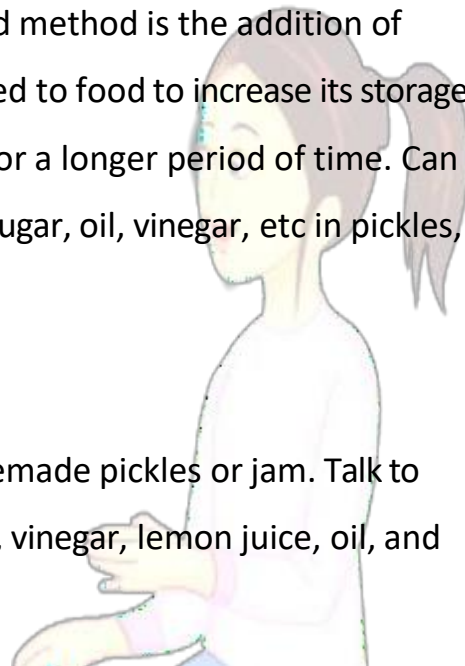
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- The question is where do these microbes come from? They are present all around us and like all living beings they require favourable conditions like air and moisture, the appropriate temperature, and of course food to survive and grow. Some factors which promote growth of microorganisms in food are:
 - Food having high moisture content like fruits and vegetables like tomatoes.
 - Micro-organisms are present in the air surrounding the food.
 - Food products decay at room temperature, if kept for a long time like, green leafy vegetables turning yellow or curdling of milk.
 - Foods that have low sugar, or salt present in them or are high in acid content.



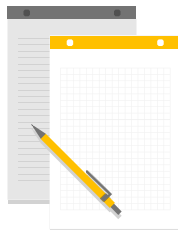
3.2: Common methods of Preservation – use of salt, oil, vinegar, salt, and sugar.

- If we wish to increase the shelf life of food items, we have to prevent the spoiling of food by the action of micro-organisms. The most common method is to remove the conditions required for their growth. Apart from many methods discussed in the previous chapter, one very efficient and commonly used method is the addition of preservatives. A preservative is a substance that is added to food to increase its storage time or shelf life thereby keeping it fit for consumption for a longer period of time. Can you give some examples of preservatives? Use of salt, sugar, oil, vinegar, etc in pickles, fruit jam, etc.



3.3: Types of Preservatives

- Think of some ingredients found in your favourite homemade pickles or jam. Talk to elders in your family. Natural preservatives like salt, sugar, vinegar, lemon juice, oil, and spices are used very commonly.



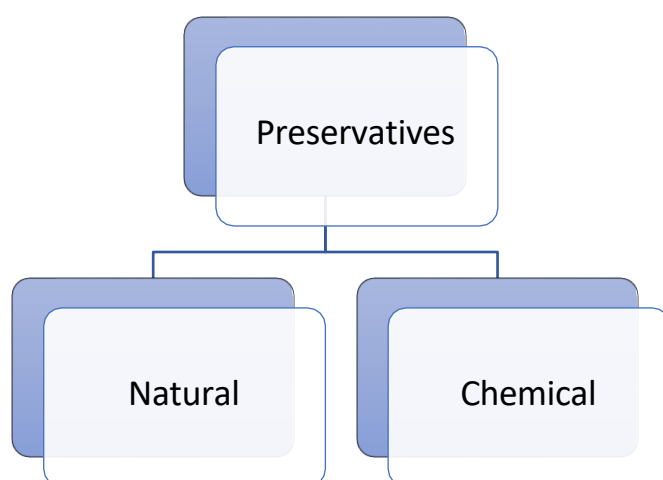
Activity Time

- Read the label of a market bought jam/ pickle/ squash/ ketchup. Write the preservatives mentioned on the label. Enter the information in the table below:

S.No	Food item	Preservatives used

- You may find names of some of the chemicals like, potassium metabisulphite, citric acid and sodium benzoate. These are called chemical preservatives.

3.4: Chemical vs Natural Preservatives



- **Salt:** It is one of the ingredients used when you make pickle at home. Is it added only for taste? Salt acts as a preservative by reducing the amount of moisture in the food and as a result, the microorganisms are not able to grow, and the food becomes safe. It also reduces the activity of enzymes in foods and prevents the food from getting spoilt.



- **Sugar:** Jams, jellies and squashes are preserved by adding sugar. Sugar reduces the moisture content of food items which is an important factor required for the growth of microbes responsible for spoiling food.
- **Acids:** Think of the taste of tomato ketchup, pickles, jams, etc. The tanginess in them is due to the presence of lemon juice/ vinegar in them which make the medium acidic, thus preventing the growth and activity of micro-organisms.

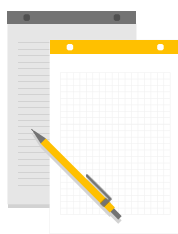
- **Oils and Spices:** Spices like mustard powder, turmeric and red chillies prevent the growth of microorganisms, thus preventing spoilage. The use of oil prevents spoilage of pickles because the layer of oil over the pickle prevents contact of air with food.



Which preservatives to use?

- We have been preserving food for hundreds of years. However, in recent times there has been a debate about the preservatives used today and how they impact our health.
- Salt and sugar are the most commonly used preservatives but have been linked to poor health if consumed in excessive amounts. A diet high in sodium has been linked to cardiovascular disease, chronic kidney disease, osteoporosis, and stomach cancer whereas a diet high in sugar has been linked to obesity, diabetes, and heart disease.

- **Artificial preservatives generally use chemicals** to keep packaged and fresh food from spoiling. Chemical additives have been extensively used to prevent the growth of microorganisms. These artificial preservatives are deemed safe in the amounts they are used but their safety and impact on human health are under discussion. Several researchers have reported that artificial preservatives such as nitrates, benzoates, sulfites, sorbates, parabens, formaldehyde, BHT, BHA and several others can cause serious health hazards such as hypersensitivity, allergy, asthma, hyperactivity, [neurological damage and cancer \(source - https://ijpsr.com/bft-article/artificial-preservatives-and-their-harmful-effects-looking-toward-nature-for-safer-alternatives/](https://ijpsr.com/bft-article/artificial-preservatives-and-their-harmful-effects-looking-toward-nature-for-safer-alternatives/)
- Here is an interesting article if you want to know more about preservatives - <https://cen.acs.org/articles/95/i31/The-long-road-to-all-natural-preservatives.html>



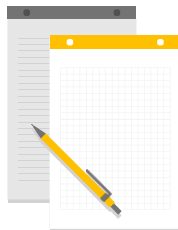
Activity Time

1. *Saviour Spices*

Collect the following food products and place them as per instructions:

- a) Take a bowl of curd, a few fruits, and vegetables. Keep them outside the refrigerator for 4 days.
- b) Take any 4 spices. Keep them aside in an open container 4 days.

Note the changes that take place, tabulate your observations and possible reasons for the changes taking place.



Activity Time

2. *Keeping the Beet*

To identify the various methods of preserving food.

Steps:

1. Collect seven test tubes and label them 1 to 7.
2. Put a small piece of beetroot in each test tube. Put test tube 1 in the fridge.
3. Add water sufficient to cover the test tubes 2 to 7 as follows - distilled water, dilute sodium chloride solution, concentrated sodium chloride solution, concentrated sugar solution, vinegar, sodium nitrite solution.
4. Cover each tube with cotton wool and leave for at least 48 hours at room temperature (except tube 1).
5. Predict what will happen to the beetroot after 48 hours and add your prediction to the table below.
6. After 48 hours examine the tubes and record the appearance of the beetroot and solutions.

Test tube	My Prediction
1	
2	
3	
4	
5	
6	
7	



Check your understanding

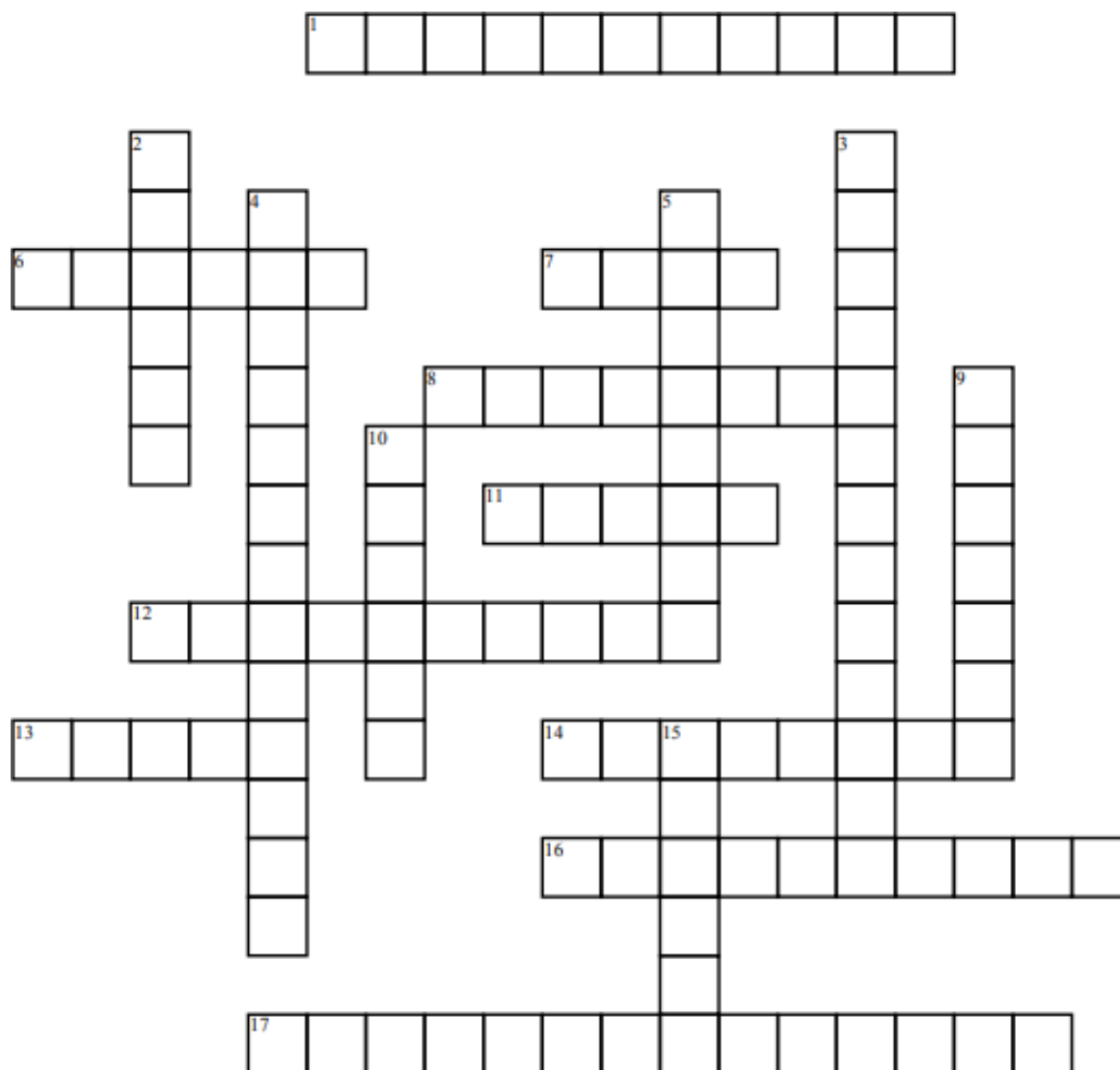
1. Give reasons for the following:

- a) Spices are added to pickles.
- b) When making jams, we make use of acid and a lot of sugar for preservation.

2. Match the food item to correct method of preservation:

- | | |
|----------------|-------------------------|
| i. Jam | a. Spices |
| ii. Papad | b. Sugar |
| iii. Pickle | c. Citric acid |
| iv. Milk | d. Removal of moisture |
| v. Dried-methi | e. Pasteurization |
| vi. Squash | f. Oil, Salt |
| | g. Reducing temperature |

3. Complete the crossword below with the help of clues provided:



Across

1. sugar reduces water content
 6. microbes require _____ for survival
 7. _____ degrees is the temperature for freezing
 8. lower pH inhibit

11. foods will eventually

12. a process in which food spoils, but results in the formation of an edible product.

13. modern day example of drying

14. pressure foods in vinegar or other organic acid

16. can make food more nutritious

17. helpful

_____ lower pH

Down

2. oldest known method

3. one of the modern methods of food preservation

4. prolongs shelf life of food and slows growth of most organisms

5. easiest, least time-consuming and most convenient method

9. two methods-water boiling and pressure...

10. the best example of fermented food

15. A methods of preserving foods, most commonly by treating them with salt or sugar.

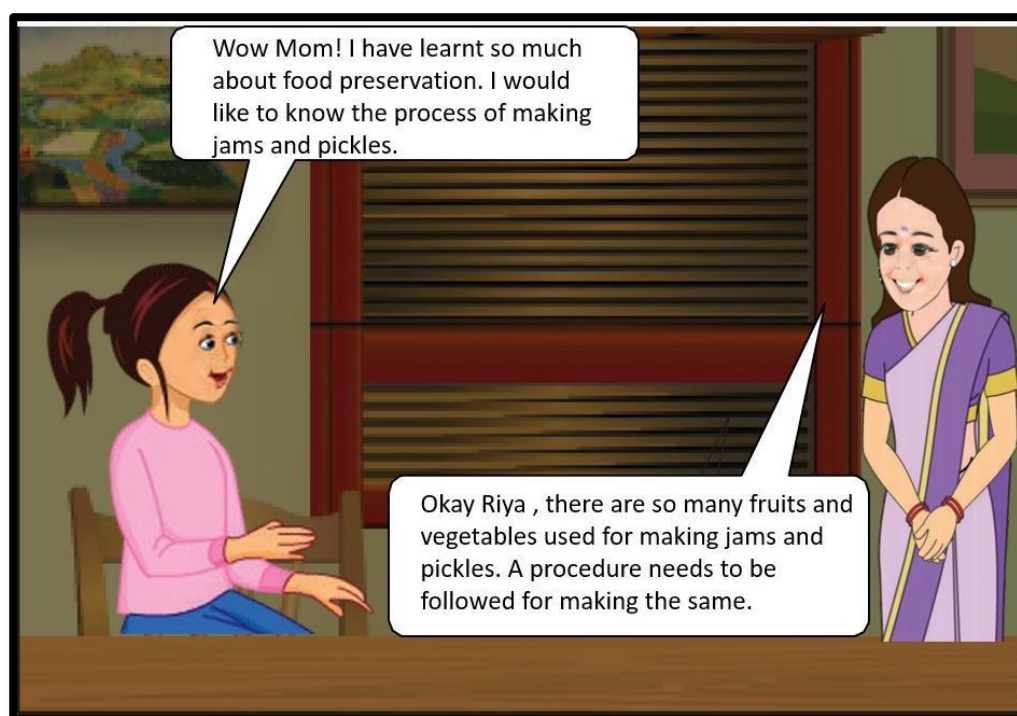
Topic 4: Learning to make Pickles, Jams and Jellies

Learning Objectives:

- To expand the knowledge on pickling and its possible health benefits.
- To enable students to use their skills and information gathered to prepare jam/ pickle of chosen fruit/ vegetable by handling required tools and raw material efficiently.

Learning outcomes:

- Students will be able to prepare jam/ pickle of chosen fruit/ vegetable by using the knowledge and skills acquired.



Riya's mother shares some of the popular recipes with her.

1. : Apple Jam

Ingredients for Apple Jam

- Apples - 1 kg (5-6)
- Water - 100 grams (1/2 cup)
- Sugar - 800 grams (4 cup)
- Elaichi (Cardamom) - 4 (peel and crushed to make a fine powder)
- Lemon juice - 1 tbsp (2 lemons)

Apple Jam Recipe

- Wash the apples, dry them or wipe with a cloth and peel them. Cut the flesh into small pieces.
- Put the apple pieces in a utensil with a thick base, pour water, cover with a lid and boil till the apple pieces turn soft.
- After the apples turn soft, mash them properly with a spoon.
- Put sugar in the mashed apples and stir well to let the sugar blend in. Allow mixture to cook, if required you can mash the apples more.
- Keep stirring to prevent the mixture from sticking to the pan's base (to check if it is cooked, pour a little bit of mix on a plate, it must fall together, water should not fall separately). Turn off the gas. Now the Jam is ready.



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4.2: Apricot Jam

Ingredients

- 2 pounds Apricots (1 kilogram)
- 1 cup Granulated Sugar (200 grams)
- $\frac{1}{4}$ cup Lemon Juice , freshly squeezed (60 ml)
- $\frac{1}{2}$ cup Water (125 ml)

Apricot Jam recipe

- Wash, cut half and pit the apricots. Put them in a pot with a wide bottom. Add water and simmer for 10 minutes, stirring continuously.
- After 10 minutes the apricots will turn into a mash. Immediately add sugar and lemon juice. Stir and simmer on low heat for 40 minutes or until it thickens . This way there is no need to sieve the mixture.
- To see if the jam has thickened, pour some of it onto a chilled plate . Let the jam cool down a bit. Now make a line through the jam with your finger. If the jam fills the space (the drawn line) it's not quite thick yet so, continue simmering. If it doesn't, you can start filling your jars.



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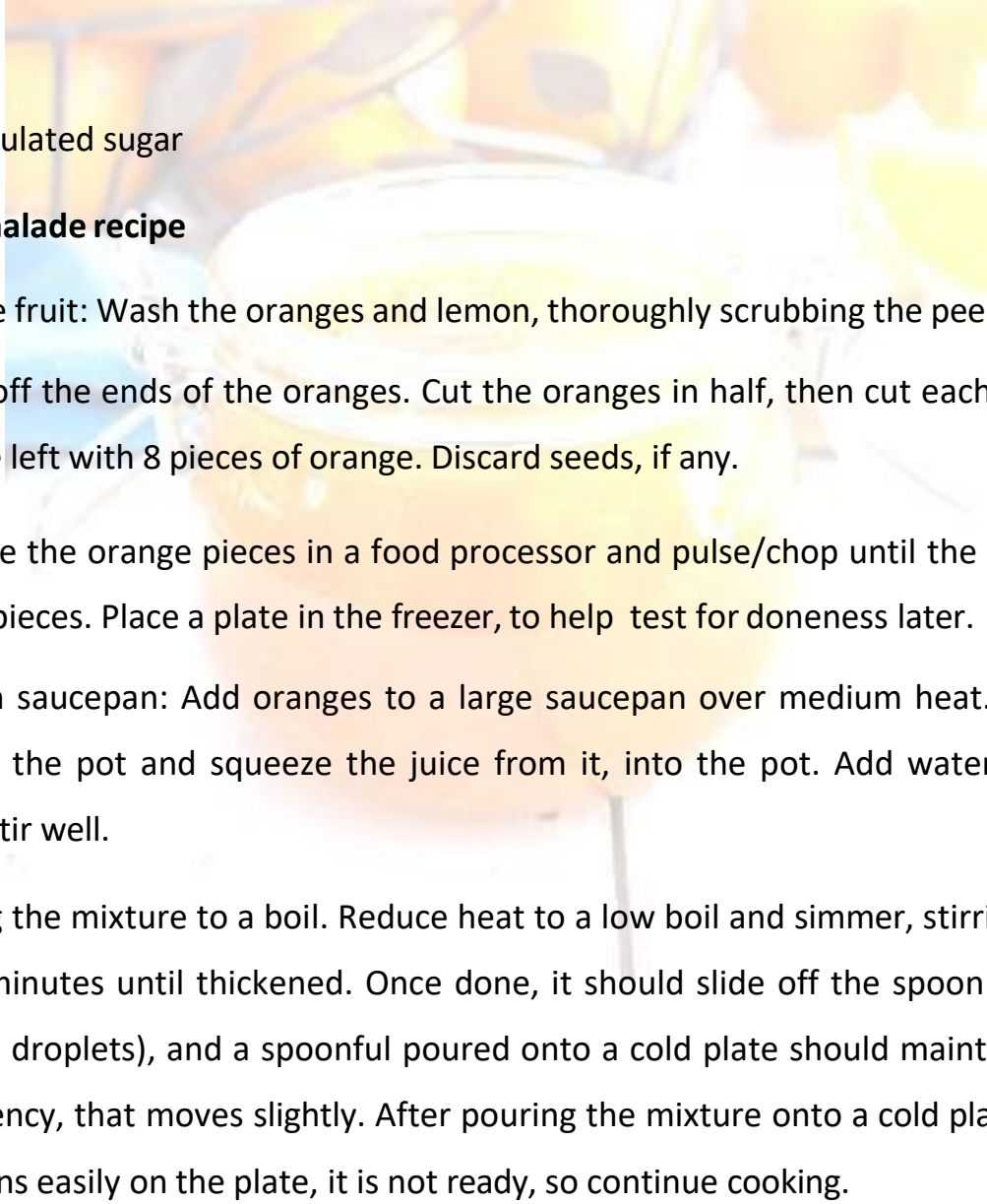
4.3: Orange Marmalade

Ingredients

- 4 medium oranges
- 1/3 cup water
- 1 lemon
- 4 cups granulated sugar

Orange Marmalade recipe

- Prepare the fruit: Wash the oranges and lemon, thoroughly scrubbing the peels.
- Chop: Cut off the ends of the oranges. Cut the oranges in half, then cut each half into 4, so you're left with 8 pieces of orange. Discard seeds, if any.
- Puree: Place the orange pieces in a food processor and pulse/chop until the rind is in very small pieces. Place a plate in the freezer, to help test for doneness later.
- Combine in saucepan: Add oranges to a large saucepan over medium heat. Zest the lemon into the pot and squeeze the juice from it, into the pot. Add water and the sugar and stir well.
- Cook: Bring the mixture to a boil. Reduce heat to a low boil and simmer, stirring often, for 30-35 minutes until thickened. Once done, it should slide off the spoon onto the sheets (not droplets), and a spoonful poured onto a cold plate should maintain a soft gel consistency, that moves slightly. After pouring the mixture onto a cold plate, if it is thin and runs easily on the plate, it is not ready, so continue cooking.
- Pour into jars or containers with a lid.
- Allow to cool to room temperature.
- Store in the refrigerator for up to 2 weeks, or freeze for up to 3 months.



4.4: Amla *Murabba*

- Amla (Indian Gooseberry) – 1 kg
- Sugar – 1.5 kg
- Cardamom – 8 to 10 (peel and grind)
- Kesar – half small spoon
- Black pepper – 1 small spoon
- Black Salt – 1 small spoon
- *Fitcari* – half spoon

Amla *Murabba* recipe

- Soak the amla with fitcari (alum) in water for 3 days. Take out the amlas and wash them. Poke the amlas with a fork.
- Put 1 litre water in a utensil and heat it. After the water boils, add the amlas and turn off the burner. Keep the utensil covered for 10 minutes.
- Take out the amlas and keep them in a filter so that the water seeps away.
- Mix ½ litre water in sugar and make a sweet syrup. Put amlas in the sweet syrup and heat them. After the amlas become soft and the sweet syrup becomes thick, turn off the burner.
- Now mix cardamom, black pepper, black salt and kesar in the amla syrup. Cool the Amla *Murabba* and store them, along with sweet syrup, in a glass container.



<https://recipebyreena.com/wp-content/uploads/aamle-ka-murabba-recipe.jpg>



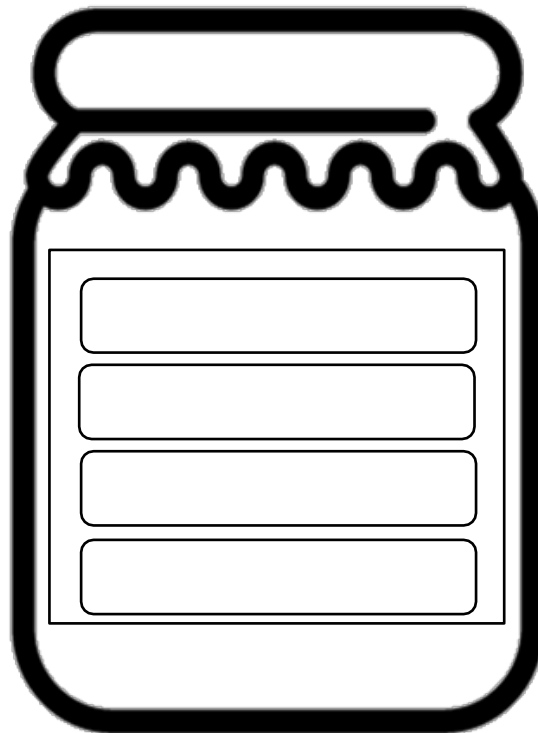
Activity Time

1. Reema's family has some apple trees in their garden. This year the produce was excellent, and they now have plenty of apples after the harvest. List the products you can prepare to preserve them. Describe the process of preparing any one preserved product using apples.



Check your understanding

1. Now you know the importance of various ingredients used for making jams, label the given jam jar with the ingredients required and their importance of the jam of your choice:



- a) If lemon juice is not added while preparing apple juice, what effect will it have on the final product?
- b) Is there any effect on the jam, if powdered sugar is used in place of granulated sugar?
- c) Can you replace any ingredient with a healthier alternative?
- d) Why is it important to cool the jam before pouring it into the container?

4.5: Sweet Beetroot Julienne Pickle

Ingredients:

- 6 - Beetroots
- 2 tbsp - Sugar
- 1/2 cup - Vinegar
- 1/2 cup – Water

Sweet Beetroot Julienne Pickle recipe:

- Wash the beetroots.
- Skin the beetroots, make juliennes or slice them as per your preference and boil for 2-3 minutes.
- In a bowl mix vinegar, water and sugar.
- Soak the beetroot in the solution and store in sterilized glass jars.
- This stays fresh for up to a month in refrigerator.



- <https://www.piqsels.com/en/public-domain-photo-zcdiz>

4.6: Carrot Pickle

Ingredients:

- 3 carrot (thickly sliced (approx. 1½ cups chopped carrot))
- ¼ tsp turmeric powder
- 1 tsp mustard seeds (powdered)
- ¼ tsp methi / fenugreek seeds (dry roasted and powdered)
- 1 tbsp salt (adjust to your taste)
- 1 tsp white vinegar
- 2 lemon juice
- 5 tbsp oil
- 2 inches ginger (thinly sliced)
- ¾ tsp mustard seeds / rai
- 1 dried red chilli
- ¼ tsp hing / asafoetida
- 10 curry leaves

Carrot Pickle Recipe:

- Firstly, in a large pan add 2 tbsp of oil and add ginger juliennes (thick pieces of ginger) to it.
- Now, add chopped carrot and sauté.
- Sauté on a medium flame for 1 minute. Keep them aside.
- Next, to the same oil, add 3 more tbsp of oil.
- Once the oil is sufficiently hot, add mustard seeds, red chilli, hing and curry leaves. Sauté till the mustard seeds splutter.



- Furthermore, add 2 tsp of chilli powder, turmeric powder, mustard powder, fenugreek powder and salt. To prepare fenugreek powder and mustard powder, dry roast and powder them.
- Mix well and switch off the flame.
- Now add fried carrot and ginger.
- Additionally, add a teaspoon of vinegar and juice of 2 lemons.
- Mix well. Once the pickle cools down completely, transfer it to a glass jar and clean the sides with the help of a tissue paper.
- Finally, serve the pickle immediately or store in an airtight container.



Photo by [Iulia Buta](#) on [Unsplash](#)

4.7 Green Chilli Pickle

Ingredients

- 10 green chilli (medium spiced)
- 1 tsp jeera / cumin seeds
- 2 tsp mustard seeds / rai
- 1 tsp coriander seeds
- ¼ tsp fenugreek seeds
- 1 tsp fenne seeds
- ½ tsp carom seeds
- 1 tsp turmeric powder
- salt to taste
- 1 lemon
- ¼ cup oil / mustard oil
- pinch of hing / asafoetida
- 2 tbsp vinegar

Green Chilli Pickle

- First, remove the head of chilis and cut into pieces.
- Further, in a cauldron dry roast 1 tsp jeera, 2 tsp mustard seeds, 1 tsp coriander seeds, ¼ tsp fenugreek, 1 tsp fenne and ½ tsp carom.
- Dry roast on low flame for a minute.
- Cool completely, and blend to slightly coarse powder.
- Transfer to the masala powder onto the chillis and add 1 tsp turmeric, salt to taste and 1 lemon.
- Mix well.



- Now heat $\frac{1}{4}$ cup oil. Once the oil is hot, add a pinch of asafoetida.
- Allow the oil to cool completely and pour over chilis, also add in 2 tbsp vinegar.
- Mix well and pickle is ready. It can be consumed after 2 hours



- https://www.manjulaskitchen.com/wp-content/uploads/green_chili_pickle.jpg

• 4.8 Lemon Pickle

Ingredients

- 250 grams lemons or 6 to 7 medium sized lemons
- 1 tablespoon carom seeds
- 1 tablespoon salt
- $\frac{1}{2}$ tablespoon red chilli powder or cayenne pepper

Lemon Pickle recipe

- First, rinse the lemons thoroughly in water. Then place them in a clean plate or kitchen towel and let them dry naturally at room temperature.
- Before beginning, do make sure that your hands, chopping board, knife, kitchen towels, bowls, spoons and jar are clean and moisture free.
- Later take each lemon and cut four sides, keeping the lemon intact and whole. Do not cut through completely. Cut all lemons in the same manner.

- Squeeze a bit of juice – about ¼ to ½ teaspoons from each lemon piece into a bowl.
- Set the bowl of lemon juice aside to use later. Adding some lemon juice helps to preserve the pickle.

Making Spice Mix

- In another plate or bowl, take 1 tablespoon carom seeds, ½ tablespoon red chili powder and 1 tablespoon salt.
- Mix very well and set aside.

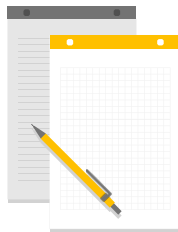
Stuffing The Mixed Spices

- Now with your fingers or a small spoon stuff this spice mix in each lemon. Set aside.
- Place the lemons in a clean glass jar. You can sun dry the empty jar for 1 to 2 hours if you want.
- Now remove the seeds and pour the lemon juice which was in the bowl in the jar.
- Add leftover spice mix if any on the stuffed lemons in the jar.
- Sprinkle some salt (about ½ to 1 teaspoon) all over the lemons. This is essential so that the lemons don't spoil during the pickling process.
- Cover with a lid and keep the jar in sunlight for 4 days. Every day shake the jar.
- The tangy lime pickle will be ready after 4 to 5 days and then you can serve it with your meals.

Storage

- Store the lemon pickle in an air-tight jar in your refrigerator. Do not keep it at room temperature. This lemon pickle keeps well for a month when refrigerated.





Activity Time

1. Interview With Grandma

Interview your grandparents and collect the following information:

- Food items that they use for pickling.
- Reason for pickling
- Process (in brief) followed for Pickling.
- Precautions they took while pickling.

2. Partner Talk

- One student will taste the fresh product while the other will taste the pickled product and then discuss their flavours and the benefits of each of them.
- Their findings can be represented in the form of a table or presentation.



Check your understanding

1. Answer the following questions:

- In the making of lemon pickle _____ plays the same role as sugar in a jam.
- Food items like jams and pickles are protected by using _____.
- Pickles turn black due to _____.
- Pickles are stored in airtight containers to _____.
- List one precaution that must be undertaken before making any pickle _____
- List any two preservatives that are used for making pickles
 - _____
 - _____

Topic 5: Commercial Considerations: Managing Profit and Quality

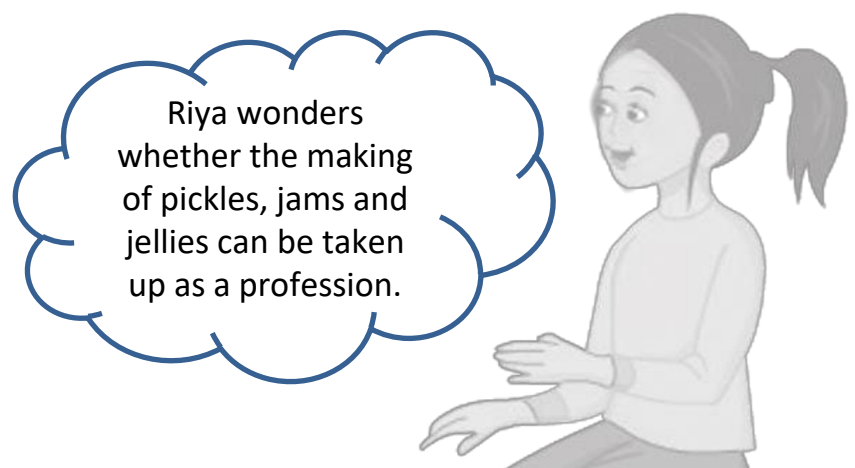
Learning Objectives:

- To enable students to gain an insight into the commercial aspects of the product.
- To discuss the role of packaging and branding in product preservation and marketing.

Learning outcomes:

At the end of the unit, students will be able to:

- Reinforce many important mathematical skills such as accurate measuring and constructing, visual problem solving and strategic forward planning.
- Know the difference between cost price, selling price, profit, loss etc.
- Suggest packaging, branding in and marketing strategies for their product.
- To equip students with the entrepreneurial skills required for a start up.



- Here are some stories that will give you an insight into making the skill into a profitable business.

[The Success Story of Kong Kara, the Food Entrepreneur from Shillong | Official website of Meghalaya Basin Development Authority, Government of Meghalaya, India \(mbda.gov.in\)](#)
[AJHS 5\(1\).p65 \(researchjournal.co.in\)](#)

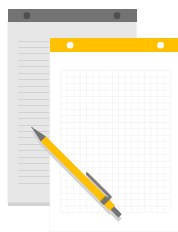
- However, there are certain skills we must develop prior to any start-up. They include commercial aspects, packaging, and branding, marketing, the unique selling proposition of your product etc. Let us try to learn them through some interesting activities.

5.A. Apple Jam

Material required	Apple, Sugar, lemon, etc	Rs70
Packaging	Glass Bottle (airtight)	Rs25
Logo	Design and printout	Rs 10
Advertisement	Pamphlet, online marketing(Facebook page, Instagram page etc.)	Rs5
Storage	Refrigerator(electricity bill)	Rs 1
Cost price	Jam	Rs111
Selling price	Jam	Rs 130

5.B. Carrot Pickle

Material required	Carrot, ginger, mustard seeds, turmeric etc.	Rs 50
Packaging	Glass Bottle (airtight)	Rs 25
25	Design and printout	Rs 10
Advertisement	Pamphlet, online marketing(Facebook page, Instagram page etc.)	Rs5
Storage	Dry Place	Rs 0
Cost price	Pickle	Rs 90
Selling price	Pickle	Rs 110



Activity Time

A simple method to calculate the profit margin of each pickle can be:

- The price on which you are selling one jar of pickle – (Cost of vegetable + Cost of other raw materials such as spices, salt, etc. + cost of jar + some reasonable extra amount to compensate the cost of transportation and utensils).
- Calculate the amount and profit margin for remaining products using the tables given above for reference.

4C. Branding

- Branding a product help in winning the loyalty of customer and selling the trust of our brand.
- Few suggestions are as follows :
 1. Re- evaluate the brand value and check the quality of product time to time.
 2. Effective branding on social media can help in product promotion.
Nowadays Facebook, Instagram, WhatsApp, etc play an important role in small businesses, big g business and start-ups, etc.
 3. Invest in brand videos, illustrations, graphics, artwork, written material, etc.

4D. Packaging

- Packaging should be attractive, effective according to the requirement of the product.
- It should be unique and eye catching.
- Try to make it eco–friendly and cost-effective.



Activity Time

- Students will create the logo of their product y exploring, tessellating, or layering polygons of various shapes and sizes to achieve a stunning logo.
- Students collect different brands' logos for knowledge.

HINT: MS-paint. (using different shapes, symbols and colours, etc.)



Check your understanding

1. Budding Entrepreneur – Understanding the market
 - Make use of the 4 P's of marketing (price, product, promotion, place)
 - Think about your favorite product (pickle/ jam), then research 2-3 of their promotions; try to find out the relationship between the promotion and their target customers.
2. Shark Tank Business Plan – now that you are aware of various factors involved in marketing, try to create a business plan for your pickle or jam small scale industry. You can keep following pointers in mind:

• Range of your product	• Social message (if any)
• Unique selling proposition	• Promotion - Write an advertisement for their product/service, Tagline
• Detailed information about one product	• Profit margin
• Research to back up your product claims	• Packaging

- Pitch the idea to the class and record the responses.

Glossary

- **Food Preservation (Ch 1, page no. 7)** - methods by which food is prevented from getting spoilt or to check the growth of microorganisms.
- **Murabba (Ch 1, page no. 8)** - sweet fruit preserve
- **Squash (Ch 1, page no. 8)** – concentrated fruit-flavoured syrup used in beverage making. It is made from fruit juice, water, and sugar or a sugar substitute.
- **Fermentation (Ch 1, page no. 8)** - a metabolic process that produces chemical changes in organic substrates through the action of enzymes.
<https://en.wikipedia.org/wiki/Fermentation#:~:text=Fermentation%20is%20a%20metabolic%20process,in%20the%20absence%20of%20oxygen.>
- **Decomposition (Ch 1, page no. 8)** - to break down or be broken down into simpler parts or substances especially by the action of living things. <https://www.merriam-webster.com/dictionary/decompose#:~:text=1%20%3A%20to%20break%20down%20or,decompose>
- **Microorganisms (Ch 3, page no. 19)** - Microorganisms include bacteria, protozoa, algae, and fungi which can be seen through a microscope only.
- **Enzymes (Ch 3, page no. 21)** - enzyme, a substance that acts as a catalyst in living organisms, regulating the rate at which chemical reactions proceed without itself being altered in the process. <https://www.britannica.com/science/enzyme>
- **Hypersensitivity (Ch 3, page no. 23)** – refers to undesirable reactions produced by the normal immune system, including allergies and autoimmunity. They are usually referred to as an over-reaction of the immune system and these reactions may be damaging and uncomfortable.
[https://en.wikipedia.org/wiki/Hypersensitivity#:~:text=Hypersensitivity%20\(also%20called%20hypersensitivity%20reaction,may%20be%20damaging%20and%20uncomfortable.](https://en.wikipedia.org/wiki/Hypersensitivity#:~:text=Hypersensitivity%20(also%20called%20hypersensitivity%20reaction,may%20be%20damaging%20and%20uncomfortable.)
- **Hyperactivity (Ch 3, page no. 23)** - Hyperactivity is a state of being unusually or abnormally active. <https://www.healthline.com/health/hyperactivity>

Glossary contd.

- **Ingredient (Ch 4, page no. 28)** – a food that is used with other foods in the preparation of a particular dish. <https://dictionary.cambridge.org/dictionary/english/ingredient>
- **Granulated (Ch 4, page no. 29)** – (esp. of sugar) in small grains: Granulated sugar is coarser than powdered sugar. <https://dictionary.cambridge.org/dictionary/english/granulated>
- **Saucepan (Ch 4, page no. 30)** - a deep cooking pan, typically round, made of metal, and with one long handle and a lid. shorturl.at/jpCQY
- **Consistency (Ch 4, page no. 30)** – the way in which a substance holds together; thickness or viscosity. shorturl.at/mBD48
- **Fitcari (Ch 4, page no. 31)** - Alum or Phitkari, is a transparent salt like substance that is [used in cooking as well as for medicinal purposes. https://www.1mg.com/ayurveda/alum-143](https://www.1mg.com/ayurveda/alum-143)
- **Syrup (Ch 4, page no. 31)** - The meaning of SYRUP is a thick sticky solution of sugar and water often flavoured or medicated. <https://www.merriam-webster.com/dictionary/syrup>
- **Sterilised (Ch 4, page no. 33)** - Sterilization refers to any process that removes, kills, or deactivates all forms of life (in particular referring to microorganisms). [https://en.wikipedia.org/wiki/Sterilization_\(microbiology\)](https://en.wikipedia.org/wiki/Sterilization_(microbiology))
- **Sauté (Ch 4, page no. 34)** - The meaning of SAUTÉ is to fry (food, such as small pieces [of meat or vegetables\) in a small amount of fat. https://www.merriam-webster.com/dictionary/saut%C3%A9](https://www.merriam-webster.com/dictionary/saut%C3%A9)
- **Accurate (Ch 5, page no. 40)** – free from error especially as the result of care an accurate diagnosis. <https://www.merriam-webster.com/dictionary/accurate>
- **Strategic (Ch 5, page no. 40)** – The meaning of STRATEGIC is of, relating to, or marked by strategy. <https://www.merriam-webster.com/dictionary/strategic>

Glossary contd.

- **Entrepreneur (Ch 5, page no. 40)** – An entrepreneur is an individual who creates a new business, bearing most of the risks and enjoying most of the rewards.
<https://www.investopedia.com/terms/e/entrepreneur.asp>
- **Branding (Ch 5, page no. 40)** – Branding is the process of giving a meaning to specific organization, company, products or services by creating and shaping a brand in consumers' minds. <https://www.thebrandingjournal.com/2015/10/what-is-branding-definition/>
- **Marketing (Ch 5, page no. 40)** – Marketing is the process of getting people interested in your company's product or service. <https://blog.hubspot.com/marketing/what-is-marketing>
- **Pamphlet (Ch 5, page no. 41)** – A pamphlet is a small, unbound booklet focused on a single subject, often educational in nature. <https://www.lucidpress.com/blog/what-is-pamphlets>
- **Promotion (Ch 5, page no. 42)** – Promotional marketing is a set of activities to share knowledge about a particular brand, product, or service with as many people as possible. <https://sendpulse.com/support/glossary/promotional-marketing>
- **Tagline (Ch 5, page no. 43)** – A tagline is a short, memorable phrase used in marketing campaigns to convey the value of a brand or its products.
<https://www.thebalancesmb.com/what-is-a-tagline-4017760>
- **Profit Margin (Ch 5, page no. 43)** - Profit margin is one of the profitability measures that is widely used to gauge the degree to which a corporation or enterprise is making money. <https://cleartax.in/g/terms/profit-margin#:~:text=Profit%20margin%20is%20one%20of,for%20every%20dollar%20of%20sales.>

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Image 3 - https://unsplash.com/photos/M_xlaxQE3Ms

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