

**PROCESSING TECHNOLOGIES: KNOWLEDGE OF PRODUCT PRESERVATION, PACKAGING AND STORAGE**

Product preservation, packaging and storage focuses on the ways in which products can be treated during and after their development in order to maintain their integrity over time by inhibiting internal degradation and/or protecting them from external damage. Initially students learn basic concepts relating to why certain types of products require the use of preservation techniques, and which techniques are suitable for use in domestic settings where the product planned to be used in the near future and storage will be within known environmental conditions. They also will learn how packaging and storage procedures work together to further protect products in local environments. Students progress to learning more advanced concepts relating to ensuring products maintain integrity over an extended time and the variable environmental conditions of a national market, and the increasingly sophisticated techniques used in industrial settings, and then to understanding the technical and sociocultural implications and complexities involved in the preservation, packaging and storage of products suitable for international distribution.

	LEVEL 6	LEVEL 7	LEVEL 8
<b>LO</b>	<i>Demonstrate understanding of basic concepts and techniques used in the preservation, packaging and storage of products</i>	<i>Demonstrate understanding of advanced concepts and techniques used in the preservation, packaging and storage of products</i>	<i>Demonstrate understanding of complex concepts and techniques used in the preservation, packaging and storage of products</i>
<b>TEACHER GUIDANCE</b>	<p>To support students to develop understandings about basic concepts and techniques used in the preservation, packaging and storage of products, at level 6, teachers could:</p> <ul style="list-style-type: none"> <li>• Provide opportunity for students to explore why we need to preserve certain products to maintain their integrity over time.</li> <li>• Provide opportunity for students to explore different forms of packaging and storage instructions and relate this to the specific nature of the product and the techniques used in its preservation.</li> <li>• Ensure students are aware of the requirements for labelling of preserved products to ensure end-users can make informed choices.</li> <li>• Ensure students are familiar with a wide range of basic preservation techniques (eg, freezing, heating, air drying, chemical additives – use of vinegar/sugar), and packaging (eg, bottling, vacuum packing, solid wall containers, padded protective wrapping, labelling for identification) and storage procedures (eg, freezer, refrigerator, cool/dark cupboard) commonly used in domestic situations.</li> <li>• Guide students to understand how the techniques and procedures used in preserving/packaging and storage of a range of products allows them to maintain their integrity over time and in a known environment (eg, in the home, at school).</li> <li>• Provide students with multiple opportunities to select and test different basic techniques and procedures to enhance product integrity. This would include understanding the properties and implications of the materials used in the product and what is required of the product in terms of withstanding changes over short periods of time and in known environments.</li> </ul>	<p>To support students to develop understandings about advanced concepts and techniques used in the preservation, packaging and storage of products, at level 7, teachers could:</p> <ul style="list-style-type: none"> <li>• Provide opportunity for students to explore a range of different types of products to understand the changes needed in the preservation/packaging/storage decision-making to ensure products are able to withstand changing environments over extended times (eg, preservation during transportation, storage in warehouses, packaging for safe handling etc.)</li> <li>• Guide students to develop understanding of how preserving/packaging and storage work together to ensure products maintain integrity over extended times and variable physical environments.</li> <li>• Provide students opportunity to explore and debate the implications of, and for, the distribution of products to national markets on the preservation, packaging and storage of products.</li> <li>• Provide opportunities for students to become familiar with a wide range of advanced preservation techniques (eg, spray drying of liquids, ultra violet reaction inhibition, liquid immersion freezing and chilling, chemical additives), and packaging (eg, canning, retortable pouches, gas flush packages, permeable packaging films, sealing mechanisms, portion control, labelling for point of difference – eco, heart ticks etc) and storage procedures (eg, controlled atmosphere) commonly used in industrial situations.</li> <li>• Provide students with opportunities to explore advanced techniques being used currently in a range of industries. This would include understanding the properties and implications of the materials used in the product and what is required of the product in terms of ensuring particular shelf-life and withstanding variable environmental conditions.</li> </ul>	<p>To support students to develop understandings about complex concepts and techniques used in the preservation, packaging and storage of products, at level 8, teachers could:</p> <ul style="list-style-type: none"> <li>• Provide opportunity for students to debate how the preservation, packaging and storage of products have been influenced by changes in global distribution chains. This includes ways products can be made suitable for a range of consumers who may live in different political and social environments to where the product originated.</li> <li>• Guide students to develop understanding of how preserving/packaging and storage work together to ensure products maintain integrity and acceptability over extended times and variable physical, social and political environments.</li> <li>• Provide opportunity for students to explore a range of products to understand how the preservation/packaging and/or storage has changed cultures/society (needs, desires, the way life is experienced) in the past and present and to debate how they may change cultures/society in the probable future.</li> <li>• Provide opportunities for students to become familiar with a wide range of complex preservation techniques (eg, freeze drying, UHT sterilisation, cryogenic freezing, irradiation, high pressure sterilisation), and packaging (eg, aseptic filling, modified atmosphere packs, crush protection, dosage control, brand value packaging), and storage procedures (eg, accelerated storage life trials, modified atmosphere packs commonly used for products destined for international markets).</li> <li>• Provide students with opportunities to explore the implications and complexities involved in developing and distributing 'risk' products for international markets. This would include understanding the properties and implications of the materials used in the product and what is required of the product in terms of complex distribution chains. That is withstanding significant changes of time and environmental conditions including changing social, cultural and ethical dimensions.</li> </ul>
<b>INDICATORS</b>	<p>Students can:</p> <ul style="list-style-type: none"> <li>• explain the links between types of decay and preservation techniques</li> <li>• explain why a particular preservation and packaging technique was chosen for a specific product to be stored in a local environment</li> <li>• discuss how to control the storage environment to limit decay of different types of products during storage</li> <li>• discuss why legal labelling is required in a local environment</li> <li>• compare and contrast preservation and packaging techniques for a product to be stored in a local environment.</li> </ul>	<p>Students can:</p> <ul style="list-style-type: none"> <li>• explain the links between combinations of decay mechanisms in preservation and packaging techniques</li> <li>• compare and contrast preservation and packaging techniques for a product in a national environment.</li> <li>• discuss why labelling is legally required and how labelling for marketing is used in a national environment.</li> </ul>	<p>Students can:</p> <ul style="list-style-type: none"> <li>• explain how environmental factors interact to influence product quality</li> <li>• compare and contrast preservation and packaging techniques for a product in an international environment</li> <li>• compare and contrast legal, marketing and cultural requirements for labelling in two countries.</li> </ul>
<b>AS</b>	<p><b>AS91084 Processing Technologies 1.62</b> <i>Demonstrate understanding of basic concepts used in preservation and packaging techniques for product storage</i></p>	<p><b>AS91353 Processing Technologies 2.62</b> <i>Demonstrate understanding of advanced concepts used in preservation and packaging techniques for product storage</i></p>	<p><b>AS91644 Processing Technologies 3.62</b> <i>Demonstrate understanding of combined preservation mechanisms used to maintain product integrity</i></p>
	Level 1 Processing Technologies standards & assessment resources	Level 2 Processing Technologies standards & assessment resources	Level 3 Technology achievement standards & assessment resources DRAFT