

Processing food

Introduction

These materials are intended to provide lesson ideas for Science, D&T and Literacy. The ideas and materials are suitable for children at KS1 and KS2 although some differentiation will be necessary for the youngest children. In particular, younger children will not be able to follow the written instructions on the pupil sheets. However, they will be able to manage the practical work if they are shown what to do.

The materials focus on exploring some foods and how they may be processed.

Project overview

Stage	Time	Overview
1: Introduction	5-10 mins	What do we mean by food processing?
2: Main presentation	10-15 mins	A presentation describing some ways in which foods may be processed.
3: Investigation work	20-120 mins	There are four suggested investigations relating to food processing: 1: Making and testing red cabbage indicator. 2: Making dried fruit snacks. 3: Drying herbs. 4: Making ice cream in a bag.



Exploration 1: Making and testing red cabbage indicator

Suggested equipment and materials:

The PowerPoint presentation or the student sheet, kettle, plastic beakers, filter funnel, filter paper, chopping board, knife, household products to test (see suggested list), test tubes and rack, dropping pipettes.

Task overview:

Children use red cabbage indicator to test household products. They use the indicator to judge whether each substance is strongly acidic, weakly acidic, neutral, weakly alkaline or strongly alkaline.

Instructions:

To make the indicator, finely shred the red cabbage and pour boiling water to just cover the leaves. Leave for ten minutes for the water to leach out the pigment. If you want a more intense indicator colour, you may boil the shredded cabbage in a pan for about ten minutes. If you do not have test tubes, you can make red cabbage indicator paper by soaking filter paper in the red cabbage solution and then hanging the paper overnight to dry. It can then be cut into strips. Children can test the solutions easily by dipping an indicator paper strip into each solution and matching the colour of the strip to the colour chart on the children's materials.

Suggested household products may include: lemon juice, vinegar, lemonade, mineral water (sparkling and still), rain water, tap water, shampoo solution, washing-up liquid solution, weak tea solution, milk, baking soda solution, bicarbonate of soda solution, salt solution.

You must not use cleaning substances such as drain cleaner or oven cleaner which are hazardous. Hazardous products can be identified by hazard warning labels on the products. You must follow any safety guidance on non-hazardous products.

To make solutions of shampoo and washing-up liquid, use about one-part product with ten parts water. To make solutions of salt, bicarbonate of soda and baking soda, use about one teaspoon to 100 ml of water.



Exploration 2: Making dried fruit snacks

Suggested equipment and materials:

The PowerPoint presentation or the student sheet, chopping board, knife, peeler, sieve or colander, apples, cherries, bananas, strawberries, oven trays, greaseproof paper, sieve, kitchen towel, fruit, pineapple, orange, lemon or grapefruit juice as a pretreatment solution, oven thermometer, access to an oven.

Task overview:

Children make dried fruit snacks by drying fruit slices in an oven at a low temperature.

Instructions:

Apple and banana slices can be pretreated by dipping them in a solution of fruit acid before drying them. This prevents the fruit from browning (due to oxygen in the air) and slows down the growth of microbes. Pineapple, orange, lemon or grapefruit juice can be used as the pretreatment solution.

Safety instructions:

Children should wash their hands thoroughly before handling fruit to reduce the risk of transferring harmful microorganisms. Children suffering from illnesses such as sickness, diarrhoea, colds, coughs or other infections should not prepare food. Ideally, children will only eat the food they prepare. You can achieve this by identifying each child's fruit on the greaseproof paper. Apples, strawberries and cherries should be washed before using.

The oven should be capable of maintaining a temperature of between 55 and 65°C with the door slightly ajar. The door needs to be ajar to allow evaporating moisture to escape from the oven. Please note that the temperature control on an oven rarely has temperatures below 100°C marked, and some ovens are not capable of maintaining a suitable temperature. You must test your oven temperature before starting the practical. Place an oven thermometer on the middle shelf and set the oven to somewhere between the 'On' setting and 100°C. Use the thermometer reading to adjust the temperature control to give the right temperature.



Exploration 3: Drying herbs

Suggested equipment and materials:

The PowerPoint presentation or the student sheet, paper bags, growing herbs, elastic bands, thin string.

Task overview:

Children make bunches of growing herbs and hang them in the classroom to dry.

Instructions:

Herbs with strong leaves tend to be easier to dry because they retain their colour and shape. For example, bay, rosemary, thyme and sage leaves work well. Tender and broad-leafed herbs such as basil, parsley, mint and tarragon do not dry as easily and may turn mouldy.

Growing herbs may be sourced from supermarkets or garden centres. Alternatively, they may be grown from seed to further enrich the task. This links well with the Y2 and Y3 Plants topics.

Children can punch holes in the bags by carefully using a kebab stick or similar. The holes help with air circulation whilst the bags reduce airborne dust and insects landing on the herbs. Once the herbs are completely dry, they can be ground in a pestle and mortar or used as bouquet garnis in cooking.

Safety instructions:

Children should wash their hands thoroughly before handling herbs to reduce the risk of transferring harmful microorganisms. Children suffering from illnesses such as sickness, diarrhoea, colds, coughs or other infections should not prepare food. Each child can identify their herbs by writing their name on the paper bag. Herbs should be rinsed with cold water in a sieve or colander and excess water shaken off before drying.



Exploration 4: Making ice cream in a bag

Suggested equipment and materials:

The PowerPoint presentation or the student sheet, table salt, large zip-lock bags (about 5 litre/approximately 30 x 30 cm), small zip-lock bags (about 0.5 litre/ approximately 15 x 15 cm), about six bags of ice, whole milk, sugar, vanilla essence, spoons gloves, measuring jug.

Instructions:

Whole milk works better than semi-skimmed or skimmed milk. Cream may be added to the milk for creamier ice cream.

Safety instructions:

Children should wash their hands thoroughly before making ice cream to reduce the risk of transferring harmful microorganisms. Children suffering from illnesses such as sickness, diarrhoea, colds, coughs or other infections should not make ice cream. Ideally, children will only eat the ice cream they prepare.

The ice/salt mixture can easily drop to -10°C in temperature and so children must wear gloves while mixing their ice cream.



Possible links to the English National Curriculum

Stage/subject	Topic	National Curriculum statements
KS1: Science	Y1: Living things and their habitats	<ul style="list-style-type: none"> Identify and name a variety of plants and animals in their habitats, including micro-habitats. Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.
	Y2: Plants	<ul style="list-style-type: none"> Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.
	Y2: Animals including humans	<ul style="list-style-type: none"> Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.
	KS1 :Working Scientifically	<ul style="list-style-type: none"> Asking simple questions and recognising that they can be answered in different ways. Observing closely, using simple equipment. Performing simple tests. Identifying and classifying. Using their observations and ideas to suggest answers to questions. Gathering and recording data to help in answering questions.
KS1: Design and technology	Cooking and nutrition	<ul style="list-style-type: none"> Use the basic principles of a healthy and varied diet to prepare dishes. Understand where food comes from.

LKS2: Science	Y3: Plants	<ul style="list-style-type: none"> Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.
	Y3: Animals including humans	<ul style="list-style-type: none"> Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.
	Y4: States of matter	<ul style="list-style-type: none"> Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.



	LKS2 Working Scientifically	<ul style="list-style-type: none"> Asking relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair tests. Making systematic and careful observations . Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings.
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UKS2 Science	Y6: Animals including humans	<ul style="list-style-type: none"> Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Describe the ways in which nutrients and water are transported within animals, including humans .
	UKS2 Working Scientifically	<ul style="list-style-type: none"> Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Using test results to make predictions to set up further comparative and fair tests. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Identifying scientific evidence that has been used to support or refute ideas or arguments.
KS2 Design and technology	Cooking and nutrition	<ul style="list-style-type: none"> Understand and apply the principles of a healthy and varied diet. Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques. Understand seasonality.
KS1-KS2: 6.3: Language and literacy		The writing they [pupils] do should include narratives, explanations, descriptions, comparisons, summaries and evaluations: such writing supports them in rehearsing, understanding and consolidating what they have heard or read.

