

# Fruit 'n' Veg Week Science Ideas



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The following science curriculum resources aim to educate students from junior, middle and upper primary about different aspects of fruit and vegetables. The activities provide perfect opportunities for integration into other learning areas during Fruit 'n' Veg week.

Cancer Council WA and Diabetes WA would like to acknowledge the work of Kym Cox, Primary Teacher, Department of Education and Training, for developing these activities.

**Suitability of Activities for Different Stages of Learning**

Activity		Junior	Middle	Upper
Life and Living	Growing Salad Garden	✓	✓	✓
	Fruit and Vegetable Sort	✓	✓	✓
	Sweet Fruits		✓	✓
Natural and Processed Materials	Preserving Apples	✓	✓	✓
	Ripening Bananas	✓	✓	✓
	Secret Messages	✓	✓	✓
	Water Content of Fruit and Vegetables		✓	✓
	Red Cabbage Indicator		✓	✓



**Activity One: Outcome: Life and Living**

## Grow a mini salad garden



### Links to Outcomes

Level One	Level Two	Level Three
<ul style="list-style-type: none"><li>• Recognises that people need healthy food (such as vegetables) to survive.</li><li>• Describes common features of the growing plants (seed, stem, leaves).</li><li>• Notes the changes undergone.</li></ul>	<ul style="list-style-type: none"><li>• Describes the plant's need for light and water.</li><li>• Briefly describes basic functions of common features such as seed, roots and leaves.</li><li>• Describes the growth of seedling over time.</li></ul>	<ul style="list-style-type: none"><li>• Explains that plants need sun so that the leaves can make food.</li><li>• Identifies the differences between plants grown.</li><li>• Explains the life cycle of plants from germination to production of seeds.</li></ul>

### Lesson Summary

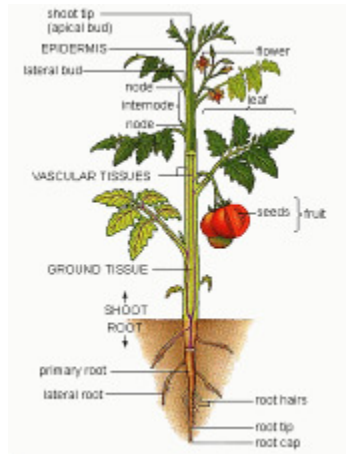
Use a quality potting mix and plant some quick growing seeds. You can use herbs such as parsley and coriander. Seeds are readily available and inexpensive. If you plant the seeds around the edge of a clear plastic cup, students will be able to observe the plant growth above and below the soil level. This activity lends itself to several different types of investigations such as those listed below:

- Do plants need water to grow? Investigate growing the plants with and without water using the investigative process.
- Do all seeds take the same amount of time to grow? Investigate how quickly different types of plants grow.
- Do plants need sunlight to grow? Investigate how the amount of sunlight affects plant growth through growing plants in full sun and a dark place such as a cupboard.
- Do all seeds germinate at the same time? Investigate how quickly different types of seeds germinate under the same growing conditions.



When the salad vegetables are grown, make a salad for all students to enjoy.

## Fruit and Vegetable Sort



### Links to Outcomes

Level One	Level Two	Level Three
<ul style="list-style-type: none"> <li>Recognises that people need healthy food (such as vegetables) to survive.</li> <li>Describes common features of the growing plants (seed, stem, leaves).</li> </ul>	<ul style="list-style-type: none"> <li>Briefly describes basic functions of common features such as seed, roots and leaves.</li> <li>Begins to make connections between form and function of plant features.</li> </ul>	<ul style="list-style-type: none"> <li>Identifies the features of plants and explains the purpose of these features.</li> </ul>

### Lesson summary

Use samples of fruit and vegetables to find out about plant parts. Sort vegetables according to the part of the plants that they come from. This gives students the opportunity to handle the vegetables and become familiar with them. At the conclusion of this activity make vegetable soup together. Alternatively, pictures of different vegetables could be used. This activity could be introduced by reading the Grimm Bros tale “Stone Soup”. Making soup also gives students an opportunity to write recounts and procedures.

Outlined below are some vegetables that are commonly found in supermarkets listed by the part of plant that they come from.

Plant Part	Vegetables
Root	Carrot, beetroot, parsnip, radish
Tuber	Potato, sweet potato
Stem	Celery, asparagus, leek, onion (the bulb is a stem in fleshy leaves)
Leaf	Cabbage, brussel sprouts, lettuce, spinach
Flower	Broccoli, cauliflower
Seed	Corn, peas
Fruit	Cucumber, eggplant, capsicum, pumpkin, tomato
Fungi	Mushrooms



## Sweet Fruits



### Links to Outcomes

Level One	Level Two	Level Three
	<ul style="list-style-type: none"><li>• Describes the plant's need for light and water.</li><li>• Understands that plants grown in tropical regions receive more sunlight.</li></ul>	<ul style="list-style-type: none"><li>• Explains that plants need sun so that the leaves can make food.</li><li>• Identifies the differences between plants grown.</li><li>• Predicts the amount of sugar that will be found in fruit according to where it is grown.</li></ul>

### Lesson summary

Students investigate which end of an orange is sweeter. The blossom end is sweetest because it is exposed to more sunlight, which leads to the production of sugar.

Students can taste different types of fruit and order them from least to most sweet. Examine which fruit is the sweetest. You should find that tropical fruits (bananas, mangoes etc) are sweeter than those from colder climates (eg apples). This is again due to the amount of sunlight.



## Preserving Apples



### Links to Outcomes

Level One	Level Two	Level Three
<ul style="list-style-type: none"><li>• Observes that the apples changed brown after being cut.</li><li>• Observes that the apples were best preserved when sprinkled with lemon juice.</li></ul>	<ul style="list-style-type: none"><li>• Observes that over time, the apples become browner.</li><li>• Understands that this change is permanent.</li><li>• Explains that the lemon juice is most affective at preventing the apple from browning.</li></ul>	<ul style="list-style-type: none"><li>• May link the browning of apple to discolouration of other fruit such as bananas and avocados.</li><li>• Suggests that lemon juice may prevent this browning too.</li><li>• May assume that it is the acidity of lemon juice that prevents browning.</li></ul>

### Lesson summary

Cut up some apples and leave them for a while on a desk. Ask students to observe what has changed from the time that the apple was cut. What can we do to prevent apples from going brown after they are cut?

Students investigate the best treatment for cut apples by brushing a range of substances onto pieces of cut apples and observing which preserves the colour best. Substances to try include vinegar, lemon juice, water and milk.

The lemon juice will produce the best results due to the Vitamin C content which is acidic. Almost all plants contain an enzyme called polyphenol oxidase. When the cells are cut, this enzyme leaks out and reacts with oxygen and turns brown (like rust on metal). This is a self defence mechanism because the brown substance is toxic to bacteria. The Vitamin C (ascorbic acid) prevents the enzyme from reacting with the oxygen. Vitamin C is one of the more powerful and well-known antioxidants. Just as exposing a cut apple to air causes it to quickly turn brown, cells of the body can also suffer damage when exposed to oxygen, a process known as oxidation.



## Ripening Bananas



### Links to Outcomes

Level One	Level Two	Level Three
<ul style="list-style-type: none"><li>• Observes that bananas changed from green to yellow and then brown.</li><li>• Observes that this process was quicker in bananas that were left in the sun.</li></ul>	<ul style="list-style-type: none"><li>• Observes that whilst the skin when dark on bananas in the fridge, the inside did not ripen.</li><li>• Observes that bananas left at room temperature ripened.</li></ul>	<ul style="list-style-type: none"><li>• Links speed of ripening to temperature, remarking that change occurs quicker at warmer temperature.</li></ul>

### Lesson summary

Students investigate whether bananas will ripen best in warm temperatures or cool temperatures. The bananas will ripen best at room temperature because heat is needed for the starch to be converted into sugar. The pectin, which keeps the cells firm, also breaks down and allows the flesh to become soft.

In the cold refrigerator, the cells of the banana become damaged. The browning enzymes are released and the skin turns black. The pectin does not break down, which means the flesh stays firm.



## Secret Messages



### Links to Outcomes

Level One	Level Two	Level Three
<ul style="list-style-type: none"><li>• Observes that the lemon juice turned brown after being in the oven.</li></ul>	<ul style="list-style-type: none"><li>• Suggests that the lemon juice turned brown because it was burnt.</li><li>• Understands that the change is permanent.</li></ul>	<ul style="list-style-type: none"><li>• Describes the colouring of the lemon juice as being a chemical change.</li><li>• Suggests that this change may be quicker at higher temperatures.</li></ul>

### Lesson summary

Students create secret messages and pictures by painting lemon juice on paper.

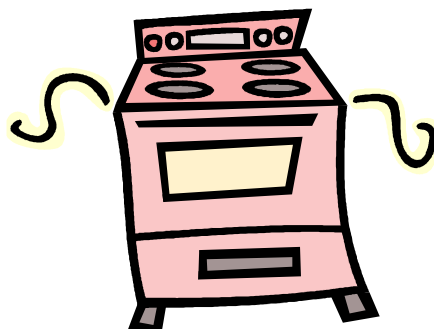
Cotton tips are great 'paint brushes' for this activity.

To reveal the secret message, put the paper in the oven on low for a few minutes.

Heating the lemon juice causes a chemical reaction which changes it from clear to brown.



## Water Content of Fruit and Vegetables



### Links to Outcomes

Level One	Level Two	Level Three
	<ul style="list-style-type: none"><li>• Observes that some of the fruit and vegetables looked dry and shrivelled.</li><li>• Understands that the water from the fruit and vegetables was evaporated out.</li></ul>	<ul style="list-style-type: none"><li>• Understands that the heat from the oven caused the water inside the fruit and vegetables to evaporate.</li><li>• Describes the process of evaporation as the water turning into a gas.</li></ul>

### Lesson summary

Students examine the water content of common fruit and vegetables.

This can be done by weighing some fruit or vegetables before placing them in a slow oven. Leave the fruit and vegetables in the oven for some time to allow them to become dehydrated.

You can make dried apples by slicing them thinly and drying them at a low temperature for an hour or so. Weigh them after removing from the oven.

In order to extend this activity for older students, start with a consistent amount of each, say 100g. This then allows for an opportunity to calculate the percentage of mass lost due to dehydration.

Dehydrated fruit such as dried apricots or apples will maintain all of their nutritional value as water is the only element that is removed during the drying process.



## Activity Eight: Natural and Processed Materials

# Red Cabbage Indicator



### Links to Outcomes

Level One	Level Two	Level Three
	<ul style="list-style-type: none"><li>• Observes that different substances caused the indicator to change different colours.</li><li>• Groups substances together according to the change they caused.</li></ul>	<ul style="list-style-type: none"><li>• Suggests that the substances that cause the same changes must have something similar in their structure.</li></ul>

### Lesson summary

This activity produces a liquid that is similar to litmus paper. Litmus paper is used to test for acids and bases by changing colour. Acids are substances such as vinegar, lemon juice and hydrochloric acids (found in our stomachs). Bases are substances such as baking soda, and sodium hydroxide (caustic soda).

To this activity you will need (per group):

- 7 red cabbage leaves
- 1½ cups water
- Blender
- Strainer
- Bowl and four clear plastic cups

Put the water and cabbage leaves in the blender and blend until finely chopped. You should have a slushy red mess. Strain the liquid into the bowl it should be purple in colour. Pour the liquid into the cups. Now you can add things which are acidic or basic (the opposite of acids). Things you could try include lemon juice, vinegar, bicarbonate soda, washing detergent, alka seltzer.



You will find that the cabbage juice turns red when mixed with acids and green when mixed with bases.