

Transpiration Investigation

Hands-on Horticulture

Take Me Home!



In collaboration with Hort Innovation, Primary Industries Education Foundation Australia (PIEFA) has developed a series of practical scientific investigations exploring Australian grown fruit and vegetables.

The **Hands-on Horticulture** resources have been designed to engage students in hands-on Australian Curriculum aligned investigations that explore Australian grown fruit and vegetables. The resources incorporate science understanding and science inquiry skills to provide meaningful learning experiences for primary-aged students. Each resource contains guidance for a teacher-led lesson to be completed in the classroom, along with a **'Take me Home!'** extension activity for students to consolidate their scientific investigation and explore the production of fruits and vegetables.

During this practical activity, students will have the opportunity to perform an experiment investigating the process of transpiration in plants.



This resource has been developed by:

Transpiration Investigation

Background information

Plants depend on a process called **transpiration** to transport water from the soil through their roots and to their leaves and flowers. This process takes place through small openings located in the leaves called stomata. The water evaporates into the air due to heat and sunlight, which helps to regulate the plant's internal water balance, cool the plant, and facilitate the transport of nutrients.

In this experiment, students will observe how the process of transpiration occurs as water is transported from the glass to different parts of the plant through special tubes called xylem. As the celery stalk takes up the water, the food colouring shows where it is moved around the plant.



ATTRIBUTION, CREDIT & SHARING



Primary Industries Education Foundation Australia's resources support and facilitate effective teaching and learning about Australia's food and food industries. We are grateful for the support of our industry and member organisations for assisting in our research efforts and providing industry-specific information and imagery to benefit the development and accuracy of this educational resource.



While reasonable efforts have been made to ensure that the contents of this educational resource are factually correct, PIEFA and Hort Innovation do not accept responsibility for the accuracy or completeness of the contents and shall not be liable for any loss or damage that may be occasioned directly or indirectly from using, or reliance on, the contents of this educational resource.



Schools and users of this resource are responsible for generating their own risk assessments and for their own compliance, procedures and reporting related to the use of animals, equipment and other materials for educational purposes.

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LESSON

Transpiration Investigation

RISK ASSESSMENTS

Note: Schools are responsible for generating their own risk assessments for activities. Risk assessments should address the potential hazards associated with using fruits and vegetables in the classroom, including food-borne illnesses, allergies, slips/falls, and cross-contamination, and propose control measures such as proper cooking, allergy awareness, accident prevention, and hygiene practices to ensure a safe learning environment for students.



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> LEARNING AREA

Science (Foundation – Year 2)

> AUSTRALIAN CURRICULUM CONTENT

Observe external features of plants and animals and describe ways they can be grouped based on these features ([AC9SFU01](#))

Identify the basic needs of plants and animals, including air, water, food or shelter, and describe how the places they live meet those needs ([AC9S1U01](#))

Pose questions and make predictions based on experiences ([AC9SFI01](#))

Pose questions to explore observed simple patterns and relationships and make predictions based on experiences ([AC9S1I01](#), [AC9S2I01](#))

Engage in investigations safely and make observations using their senses ([AC9SFI02](#))

Suggest and follow safe procedures to investigate questions and test predictions ([AC9S1I02](#), [AC9S2I02](#))

Make and record observations, including informal measurements, using digital tools as appropriate ([AC9S1I03](#), [AC9S2I03](#))

Represent observations in provided templates and identify patterns with guidance ([AC9SFI03](#))

Sort and order data and information and represent patterns, including with provided tables and visual or physical models ([AC9S1I04](#), [AC9S2I04](#))

Compare observations with predictions with guidance ([AC9SFI04](#))

Compare observations with predictions and others' observations, consider if investigations are fair and identify further questions with guidance ([AC9S1I05](#), [AC9S2I05](#))

Share questions, predictions, observations and ideas with others ([AC9SFI05](#))

Write and create texts to communicate observations, findings and ideas, using everyday and scientific vocabulary ([AC9S1I06](#), [AC9S2I06](#))

> References

Sydney Markets. (2024). What's in season? | Fresh For Kids. [www.freshforkids.com.au. https://www.freshforkids.com.au/fruit-and-veg/whats-in-season/whats-in-season-list.html?season=&month=](https://www.freshforkids.com.au/fruit-and-veg/whats-in-season/whats-in-season-list.html?season=&month=)

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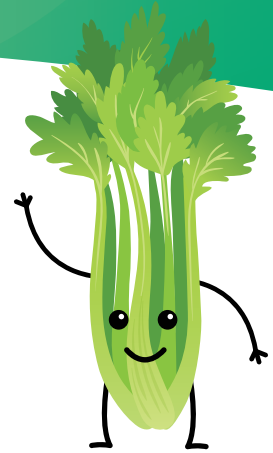
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AIM

To observe how plants transport water to their leaves and flowers through transpiration.



EQUIPMENT

Collect these materials before you start the experiment:



Food colouring



Water



A clear glass or jar



A celery stalk with leaves



A spoon



INSTRUCTIONS

1. Pour 250ml of water into the glass.
2. Add 4 drops of food colouring to the water in the glass. You can use any colour except green! Use your spoon to stir and mix the food colouring into the water.
3. Ask an adult to cut 2cm off the bottom of the celery stalk.
4. Place the celery stalk into the glass so that the bottom of the stalk is covered in the coloured water overnight.
5. Record your observations on the next page.



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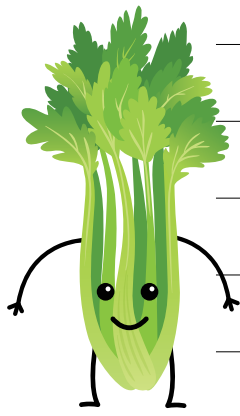
Transpiration Investigation (cont'd)

1. Make a prediction about what will happen. Record your ideas in the space below.

Leave the celery in the water overnight. Check what has happened the next day.

2. What has happened to the celery? Record your observations in the space below.

3. Why do you think the celery has changed? Record your ideas below.



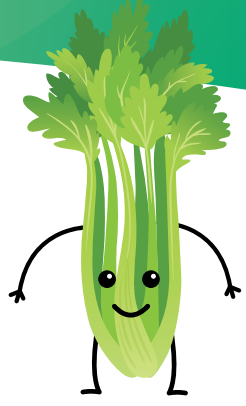
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4.

Draw and colour a picture of the celery. Use the word bank to label your picture.

Glass

Stem

Leaves

Coloured water



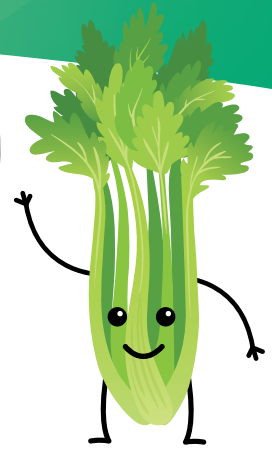
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Transpiration Investigation (cont'd)

It takes around 14 weeks from planting for celery to be harvested. Celery needs to be harvested before the plant begins to flower and its stalks become too soft to eat.

Did you know that celery grows in spring in Australia?



Scan the QR codes or click on the [link](#) to learn more about Australian seasonal fruits and vegetables.

► Fresh for Kids – What’s in Season: <https://www.freshforkids.com.au/fruit-and-veg/whats-in-season/whats-in-season-list.html?season=&month=>



5.

Use the website to research which season each of the fruits and vegetables below are available in. Record your answers in the table.



Strawberries



Cauliflower







Avocado



Carrots



Lettuce

 Summer	 Autumn	 Winter	 Spring

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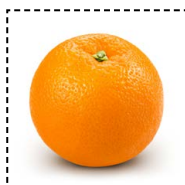
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Transpiration Investigation (cont'd)

Fruits are the part of the plant that come from flowers. They allow plants to spread their seeds. Sometimes, these seeds can still be found inside of the fruits when we are eating them, e.g. apples or watermelon

Vegetables are other parts of the plant that we eat. This could be the leaves (like lettuce), the roots (like carrots), the stems (like celery), or even the flower bud (like broccoli). Vegetables don't have seeds in them that we eat.

6. Cut and paste the pictures in the correct group.



Fruits

Vegetables

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