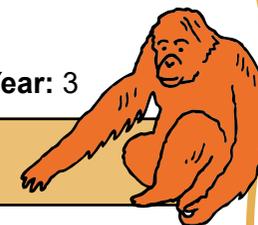
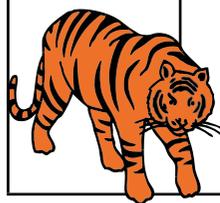


# Sustainable palm oil

**Conservation**    **Term:** Autumn    **Subject:** Science 2    **Topic:** Investigate how water is transported through the stem of a plant    **Year:** 3



	National Curriculum Links	Overview	Assessment / Questions	Resources
<b>LESSON</b>	<p><b>Plants -</b></p> <ul style="list-style-type: none"> <li>Investigate the way in which water is transported in plants.</li> </ul> <p><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>Record findings using simple scientific language, drawings and labelled diagrams.</li> <li>Use results to draw simple conclusions, suggest improvements and raise further questions for further tests.</li> </ul> <p><b>Learning Objective(s)</b></p> <ul style="list-style-type: none"> <li>To understand how water moves through a stem.</li> </ul> <p><b>Success Criteria</b></p> <ul style="list-style-type: none"> <li>I can make observations about water movement through a stem.</li> <li>I can predict how water moves through a stem based on my observations.</li> <li>I can explain water movement through a stem.</li> </ul>	<p><b>Prior learning</b></p> <p>Review prior learning and knowledge from KS1. This may be in the form of the children's own diagrams showing the different parts of a flowering plant. Most children should be able to label these plants to show the different parts. Some may be able to describe the functions of the different parts and a few will be able to explain the importance of each part to the plant as a whole i.e. what might happen if any of these parts are removed. Lower ability children may need to describe their diagrams to a teacher to show their understanding.</p> <p>It will be necessary for the children to be taught a series of lessons, focussing on the functions of the different parts of the plant. There will be a focus on the children working scientifically e.g. observing plants closely, making careful observations, comparing differences and similarities, performing experiments to answer questions:</p> <p><i>e.g. What might happen if a plant lost its leaves or its roots?</i></p> <p><b>Introduction</b></p> <p>It is hoped that questions about the function of the stem have been posed by the children themselves. The teacher could follow up on the questions posed:</p> <p><i>e.g. Why is the stem important to the plant? What might happen if the stem were removed?</i></p> <p><i>Why do plants growing together need to be upright?</i></p> <p>Discuss the need for the stem to provide structure for the plant and its use in reaching the sun; this is needed to provide the light energy they need to produce their own food and for growth. The plants will need to compete for air and light with other plants that surround them. Some children may understand that water and nutrients pass through the stem to reach the leaves. If necessary ask the question: <i>'How is water transported through a plant?'</i></p> <p>Remind or teach the children about the function of the plant by showing them the following BBC Science clip: 'What do</p>	<ul style="list-style-type: none"> <li>Follow up to questions posed by KWL activity: What might happen if the stem were removed? / Why is the stem important to a plant?</li> <li>Why is the stem important? (What would happen if it were removed? Why is it important for keeping a plant upright? Why do plants growing together need to be upright?)</li> <li>How is water transported through a plant?</li> <li>What did you observe to happen?</li> <li>Can you explain why water is able to move up the stem to the leaves of a plant?</li> <li>Why is water needed in the leaves of the plant?</li> <li>What do you think might happen if the leaves were to be removed?</li> </ul>	<ul style="list-style-type: none"> <li>Paper and pencils</li> <li>BBC Science clip: 'What do plants need to survive?' <a href="http://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-parts-of-a-plant/zvdtkpg8">www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-parts-of-a-plant/zvdtkpg8</a></li> <li>BBC Science clip: 'How does water get from the roots to the leaves of a plant?' <a href="http://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-how-does-water-get-from-the-roots-to-the-leaves/zdtfjhw">www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-how-does-water-get-from-the-roots-to-the-leaves/zdtfjhw</a></li> <li>BBC Bitesize: What do a plant's roots and stems do? <a href="http://www.bbc.co.uk/bitesize/topics/zy66fg8/articles/zcxh4qt#:~:text=The%20stem%20carries%20water%20and,keeps%20the%20plant%20standing%20upright.">www.bbc.co.uk/bitesize/topics/zy66fg8/articles/zcxh4qt#:~:text=The%20stem%20carries%20water%20and,keeps%20the%20plant%20standing%20upright.</a></li> <li>Presentation: 'Movement of water through a stem'.</li> <li>Optional: food colouring, water and a clear jug for teacher demonstration.</li> <li>Worksheet: 'How water is transported in an oil palm tree'.</li> </ul>



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plants need to survive?'

[www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-parts-of-a-plant/zvdkpg8](http://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-parts-of-a-plant/zvdkpg8)

### Activities

If time allows, the teacher could introduce the following activity using the following video, that shows the experiment of the carnation transporting coloured water (using the process of transpiration) up the stem to the leaves: BBC Science clip: 'How does water get from the roots to the leaves of a plant?'

[www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-how-does-water-get-from-the-roots-to-the-leaves/zdtfjhv](http://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-how-does-water-get-from-the-roots-to-the-leaves/zdtfjhv)

The BBC Bitesize video: 'What do a plant's roots and stems do?' could be used as an alternative stimulus to discussion:

[www.bbc.co.uk/bitesize/topics/zy66fg8/articles/zcxh4qt#:~:text=The%20stem%20carries%20water%20and,keeps%20the%20plant%20standing%20upright](http://www.bbc.co.uk/bitesize/topics/zy66fg8/articles/zcxh4qt#:~:text=The%20stem%20carries%20water%20and,keeps%20the%20plant%20standing%20upright)

Review what they have found out from the video they have watched. Alternatively, the children could be shown two actual carnation plants, one of which has been left in water and the other in coloured water. What has happened? Explain to the children that the water and nutrients are absorbed via the roots and are transported to the stem. The stem then transports the water to the leaves where it is used in the process of photosynthesis to make the plant new food. Explain that water evaporates from the leaves, leaving a space, drawing further water up from the roots. (Higher ability learners could be taught that this process is transpiration).

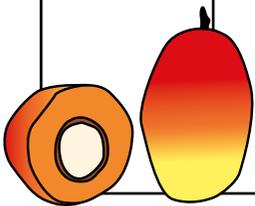
Show the Presentation, 'Movement of water through a stem', to introduce how to perform an experiment involving celery, to show how water moves through the stem of a plant. The children are encouraged to predict what might happen by drawing appropriate diagrams and are to record their observations through annotated diagrams also.

### Plenary

Review the learning objective and success criteria. Pose differentiated questions:

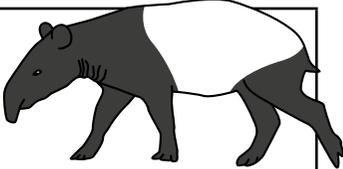
*e.g. What did you observe to happen?*

*Can you explain why water is able to move up the stem to the leaves of the plant?*



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		<p><i>Why is water needed in the leaves of the plant? What do you think might happen if the leaves were to be removed?</i></p> <p>Show the children a diagram of a plant/ tree from the rainforest e.g. oil palm tree on a worksheet: 'How water is transported in an oil palm tree'. The children should label and annotate the plant, showing how water is transported from the roots to the leaves in as much detail as they are able, to demonstrate their understanding of the process of transpiration.</p> <p><b>Possible ongoing work</b> Following the experiment, the children are encouraged to ask their own questions for further investigation of the transport of water in plants. Suggestions for further investigation are given:</p> <ul style="list-style-type: none"> <li>• What might happen if you remove the leaves?</li> <li>• What might happen if you place the plant near an open window?</li> <li>• Can you do any research on the internet or in books to see whether the leaves are important for movement of water through the stem?</li> </ul> <p>One or more of these could be investigated further, in subsequent lessons, depending on time. The children should predict what they think might happen, based on the previous work. The differentiation will depend on how the children record and present their work. Lower ability children may record their work using simple labelled diagrams and/ or photographs. More able children could record using a more structured experimental format or in the form of an information text, such as a poster or an explanation text or as a presentation. Higher ability learners should be encouraged to include further research, if possible.</p>		
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### Additional notes:

Class teachers may also wish to familiarise themselves with Chester Zoo's Plant Project:

#### THE PLANT PROJECT

Step inside a colourful haven full of exotic plants and treat yourself to a visual and sensory feast! Welcome to The Plant Project... Around the corner from The Oakfield, opposite Madagascar and tucked in next to June's Food Court, is a tropical habitat full of beautiful plants and flowers, some endangered in the wild. As you step inside our specialised greenhouse, soak in the warm air, take in the many scents and follow the winding the path around the space to discover many beautiful species found here. The Plant Project not only transports you to a tropical environment, it also highlights the important role plants play and the important conservation work our teams are doing to help protect some of the world's most endangered species. The Plant Project will continue to evolve so be sure to keep visiting this habitat to learn more about the many different plant species and the work that goes into protecting them.

[www.chesterzoo.org/our-zoo/plants-and-gardens/the-plant-project/](http://www.chesterzoo.org/our-zoo/plants-and-gardens/the-plant-project/)

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