

# Living Tree – Deconstructing and Understanding How a Tree Works



## Curriculum Links

### Scotland

I can use my knowledge of the interactions and energy flow between plants and animals in ecosystems, food chains and webs. I have contributed to the design or conservation of a wildlife area.

SCN-02

### UK

identify and describe the basic structure of a variety of common flowering plants, including trees.

## Key Concept

I can demonstrate the different parts of a tree and explain how they work together to move water, provide energy, and support life.



## Background

Trees are complex, living systems, and every part plays a vital role in keeping them strong, healthy, and alive. Instead of just looking at trees, learners will become the parts of a tree—acting out how they transport water, store energy, and interact with the environment. This interactive, movement-based lesson helps learners visualise, deconstruct, and physically experience the inner workings of trees, making scientific concepts more engaging and memorable.

## Resources

- A space outdoors with enough room for movement
- Printed tree part labels (optional, for learners to wear or hold)
- Water spray bottle or blue ribbons (optional, to represent water movement)

## Wider Skills

- Scientific understanding: Learners explore tree functions in an active, engaging way.
- Collaboration: They work together to represent an entire system.
- Critical thinking: They analyse how tree parts depend on each other.
- Creative movement: They use body and motion to model real-world biological processes.

## Metaskills

- Sense-making: Learners connect scientific concepts to movement.
- Problem recognition: They discuss what happens if one tree part is missing.
- Communicating – Giving & Receiving Information: Learners explain their role and listen to others.
- Synthesis: They combine multiple ideas to understand the tree as a whole system.

# Lesson

Introduction (10 minutes) – What Makes a Tree Work?

Gather learners around a real tree and ask:

- What does a tree need to survive?
- What happens inside a tree to keep it alive?
- How do trees help the environment?

Introduce the key parts of a tree and their functions:

- Roots – Absorb water and nutrients.
- Trunk & Xylem – Moves water up the tree.
- Leaves – Collect sunlight and make food through photosynthesis.
- Bark – Protects the tree from damage and pests.
- Branches – Spread leaves for light and support fruit or seeds.
- Stomata (on leaves) – Release oxygen and take in carbon dioxide.

Main Activity (30–40 minutes) – Becoming a Living Tree

Part 1: Assigning Roles (5 minutes)

Learners choose or are assigned a tree part:

- Roots (3–4 learners) – Kneel on the ground, reaching out like spreading roots.
- Trunk/Xylem (3–4 learners) – Stand in a line, forming the tree's transport system.
- Leaves (5+ learners) – Stand with arms raised, waving slightly like moving leaves.
- Bark (2 learners) – Stand at the edges, acting as the tree's protective layer.
- Branches (3–4 learners) – Extend outward, supporting the leaves.
- Stomata (2 learners) – Represent openings on the leaves, "breathing" in carbon dioxide and releasing oxygen.

Part 2: Acting Out the Tree's Functions (15 minutes)

The tree "wakes up" and starts moving water:

- Roots "absorb" water by reaching toward the ground.
- Trunk/Xylem lifts water upward by passing along a blue ribbon or imaginary water.
- Leaves move as if collecting sunlight, using "photosynthesis hand movements" to create food.
- Stomata pretend to "breathe," taking in carbon dioxide and "exhaling" oxygen by miming deep breaths.

Introduce a challenge:

What happens if we remove one part? Try removing a role (e.g., What if the roots stop working?).

Discuss how one missing part affects the entire system.

Alternative for younger learners:

Use basic movement—arms raised for branches, legs planted for roots, deep breathing for stomata.

Plenary (10 minutes) – Reflecting on the Tree System

Ask learners to describe their role:

How did your part help the tree?

What would happen if it wasn't there?

**Discuss:**

How do trees affect the environment beyond themselves?

How does this relate to forests and climate change?

Why do all tree parts depend on each other?

How do trees help humans and animals?

What can we do to protect trees and forests?

Learners can draw a labelled version of their "living tree", showing what each part does.

## Assessment

Understanding of tree functions:

Learners should explain what their part of the tree does and how it contributes to the whole system. Success is shown when they can describe its function clearly.

Collaboration and teamwork:

Learners should work together to form a functioning tree, showing how different parts interact and support one another.

Participation in discussion:

Learners should reflect on the experience, explaining what they learned and asking thoughtful questions.

Ability to adapt and problem-solve:

Learners should consider what happens when a tree part is removed and predict the consequences.

**Follow-up task (optional):**

- Learners create a tree comic strip, showing how it moves water and absorbs sunlight.
- They investigate different tree species and compare their structures.
- They observe trees in different seasons and predict how they change over time.

## Notes

- Encouraging Movement: Some learners may be shy about acting—let them choose their level of involvement.
- Managing Group Sizes: For large groups, create multiple trees so all learners can participate.
- Extending the Learning: If possible, visit a forest or nature reserve and observe real trees in action.
- Making It Interactive: Use props like blue ribbons (water flow) or scarves (oxygen release) to visualise movement.

## Younger Classes

- Simplify the roles—Instead of detailed explanations, focus on movement (e.g., roots wiggle underground, leaves wave in the sun).
- Use storytelling—Tell a story about a tree growing and let them act it out.
- Shorten the process—Spend more time on the movement and fun rather than detailed discussions.

## Older Classes

- Introduce scientific terminology—Encourage learners to use words like xylem, transpiration, and carbon cycle.
- Make the tree more complex—Add roles for fungi, insects, or animals that depend on the tree.
- Encourage critical thinking—Ask them to research how climate change affects tree growth and survival.