**Activity: Build a Tree**

**Learning intention:**

This is an experiential activity that uses role play to:

* illustrate the structure and function of a tree
* the relationships between different parts of a tree and living things (including people) and
* the need for action to maintain a natural resource.

**Description:**

* + Organise the group in a circle and ask what people already know about the workings of a tree. Can they name parts of the tree and what their functions are?
  + Observe a tree and discuss what parts of a tree can be seen and consider what other parts there might be that are unseen.
  + Find a flat space under or slightly away from the tree, or if preferred return to the classroom and *Build a Tree* as follows.
* Ask for volunteers to come forward and stand in the centre to act as the heartwood of the tree. Ask how this person should stand.
* Ask for volunteers to act as roots. These people lie on their backs on the ground with their feet up against the heart wood (i.e. as the roots in a star-like position). Note: if people are not comfortable lying on the ground, have them sit on seats with their backs against the trunk.
* Emphasise the role of the roots in sucking up the water.
* Instruct “the roots” to make loud slurping noises on the instruction “water in”.
* Ask the group what is used to move the water up the tree and discuss how “xylem” works.
* Ask for volunteers to be the xylem around the heartwood in between the roots. Take care not to stand near the root people lying on the ground.
* Have the individuals representing the xylem then hold hands around the heartwood.
* Instruct the “xylem” to yell out whee whee” and lift their hands above their heads to represent water moving up from the roots through the tree on the instruction “water up”.
* Ask the rest of the group how the tree manufacturers food and where it comes from.
* Discuss how food is made using sunlight, via photosynthesis in the leaves and then transferred around the tree through the phloem.
* Ask for volunteers to be the phloem and have them form a circle holding hands with their backs to the xylem. Have them hold their hands above their heads.
* Instruct the “phloem” to call out “whoo whoo” and drop their hands down toward the floor on the instruction “food down”.
* Place the remaining people around the phloem to act as the bark. The bark stands in a position facing outward to protect the tree from danger.
* Set up the tree with each group acting out their role:
* Water in – slurp slurp – roots
* Water up – whee whee – xylem (hands up)
* Food down – whoo whoo – phloem (hands down)
* Bark protection – bark bark – outside people
* Approach the group disguised as an adult beetle (perhaps with fingers on top of your ears as an antennae), to attack the tree shouting out “water in, water up, food down”. Ensure the bark responds appropriately.

**Safety Considerations**

* Ensure the ground is clear of debris and not too damp if running the experience outdoors.
* Ensure no items can fall on the group if working indoors.
* Because the experience requires students to be in relatively close contact consider cultural perspectives with respect to students stepping over one another and touching of heads or hair.

**Equipment:**

* Debrief questions on cards.

**Location:**

* Classroom
* School grounds
* Park
* Any outdoors space of about 5m x 5m

**Time:**

* 40 minutes to 1 hour

**Student processing and reflection:**

* Break into small groups to discuss the following:
* Which part of the tree were you? What role does that part have in the functioning of the tree? What other parts can you remember? What did those parts do?
* What do you think might happen if one of the parts of the tree wasn’t able to do its job?
* In what ways do trees support other living things?
* In your group draw a diagram of a tree, its functions and as many connections and relationships that you can think of from other living organisms that use or rely on that tree. You might be specific in the type of tree that you draw for example a cabbage tree or an oak tree.
* Discuss which relationships or uses might threaten the life of the tree in some way.
* Discuss how you could show on your diagram/picture relationships that are mutually beneficial, beneficial in one direction and ones that are not beneficial at all to the tree.
* Consider and action some next steps that we could take to contribute to a sustainable future for the trees in our area.

**Possible adaptations:**

* Break the activity into three sessions, the first being the observation of trees in the school grounds and determining possible parts of a tree, the second building the tree experientially and reflecting on the parts of the tree, the third session being the drawing of the diagram and considering next steps.
* For younger students reduce the parts of the tree for example, roots, trunk, branches, leaves and bark. Use cardboard labels for the parts of the tree and draw a collective tree as part of the reflection and processing. Write about the experience as a recount the following day.
* For older students increase the complexity of the parts and functions of the tree to include photosynthesis, chlorophyll, and transpiration.
* Repeat the activity with students leading and facilitating the experience.
* Adapt the process for other living organisms.

***Acknowledgement***

*This activity is adapted from a version originally sourced from the Coast to the High Country Programme.*

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| **In your group discuss:**   * Which part of the tree were you? * What role does that part have in the functioning of the tree? * What other parts can you remember? * What did those parts do? * What do you think might happen if one of the parts of the tree wasn’t able to do its job? * In what ways do trees support other living things? |

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| **In your group draw a diagram of a tree. Include:**   * its functions; * connections and relationships from other living organisms that use or rely on the tree.   Discuss which relationships or uses might threaten the life of the tree in some way. |

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| **On your diagram show relationships that are:**   * mutually beneficial; * beneficial in one direction; * are not beneficial at all to the tree.   What could be some next steps to take to contribute to a sustainable future for the trees in our area? |