

The Interconnectedness of Plants

Science 5 Unit Plan

EDUC 346 Aboriginal & Indigenous Education
Aurora Mernickle, Andrea Sturt, Sara McManus
March 28, 2022

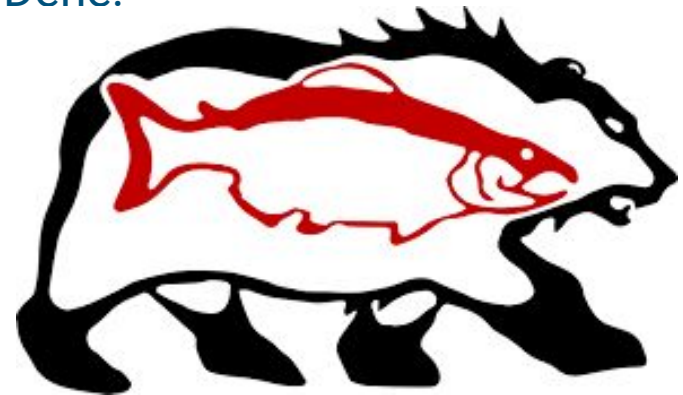


Acknowledgement - People, Place & Land



This Unit Lesson Plan has been developed by Teacher Candidates from the UNBC School of Education who attend the South-Central Campus with gratitude and respect on the traditional, ancestral, and unceded territories of the Lhtako Dené.

We honour and acknowledge Elder, Ellie Peters of the Lhtako Dené Nation for her dedication to Indigenous Education. Ellie recently retired from her position in the Quesnel School District's Ab Ed Department.



The Big Idea! (Understand)

Multicellular organisms

[i.e., PLANTS]

have organ systems that enable them to survive and interact within their environment.



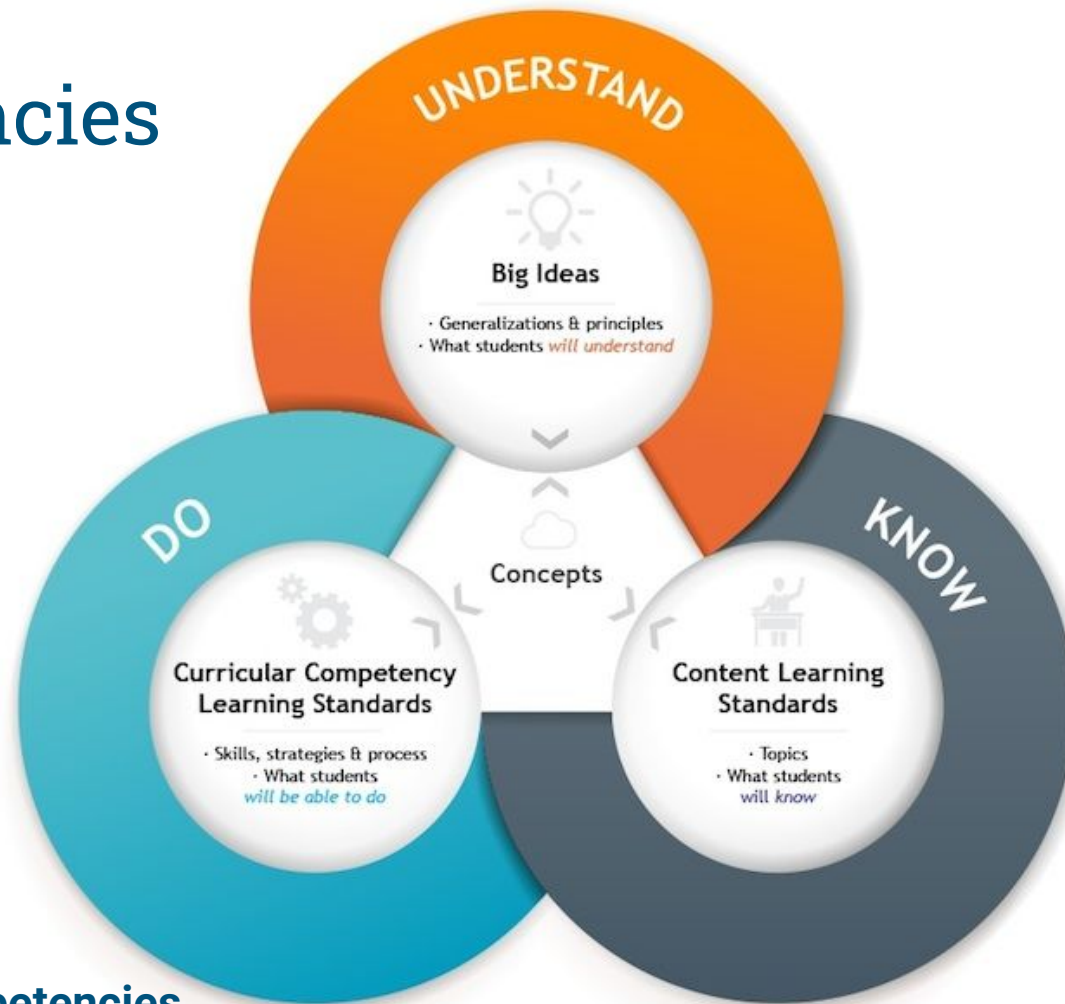
Curricular Competencies and Content

Core Competencies



Unit Covers

- All 3 Core Competencies
- 3 Main Content Areas
- 11 of 26 Science 5 Curricular Competencies





Unit Timeline - 6 Weeks!

Lesson 1	Developing Biology Knowledge & Vocabulary	1 x 45 min
Lesson 2	Plant Parts and Processes	1 x 45 min
	Plant Biology Self-Assessment Project	2 x 45 min
Lesson 3:	Plant organ systems enable them to survive and interact within their environment Includes Summative Assessment Project	4 x 45 min
Lesson 4:	Medicinal uses of plants by Dakelh (South Carrier) People Includes Summative Assessment Project	3-4 x 45 min
Field-Trip	West Fraser Timber Park	½ Day
Lesson 5:	The Social Community of Trees and How They Work Together Within the Forest Includes Summative Assessment Project	4 x 45 min
Field- Trip	Ancient Forest/Chun T'oh Whudujut Provincial Park	Full Day

6 Week Unit Based on Three Blocks Per Week and Two Field Trips

Field Trips

West Fraser Timber Park

Downtown - City of Quesnel

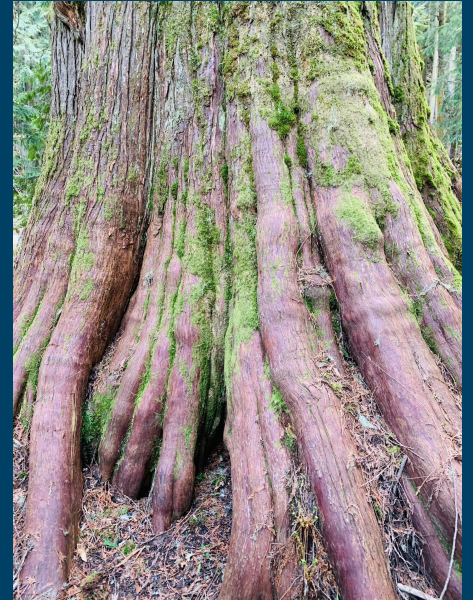


½ Day

Chun T'oh Whudujut Provincial Park

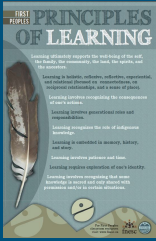
The Ancient Forest

Hwy 16 between McBride & Prince George



Full Day

*Interact with their
environment*

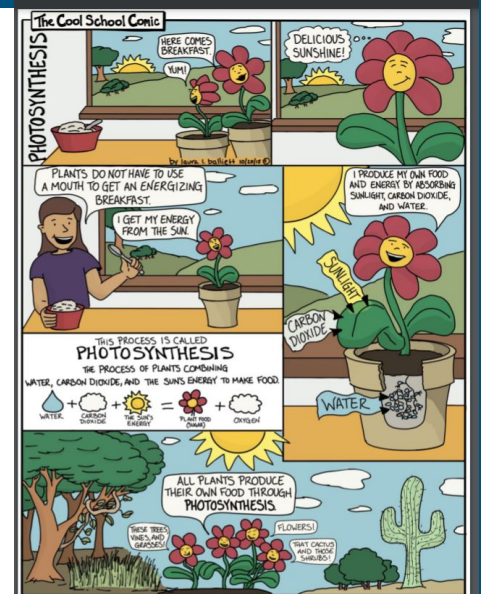
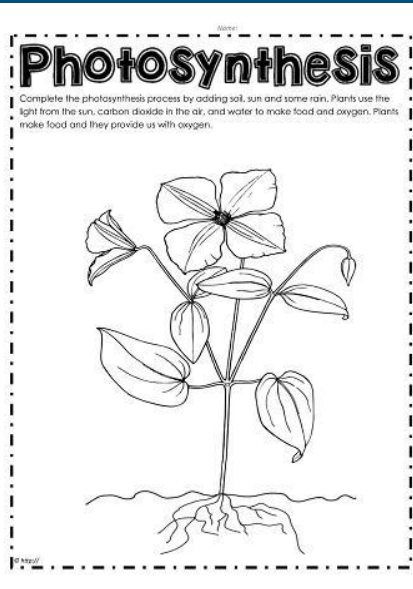
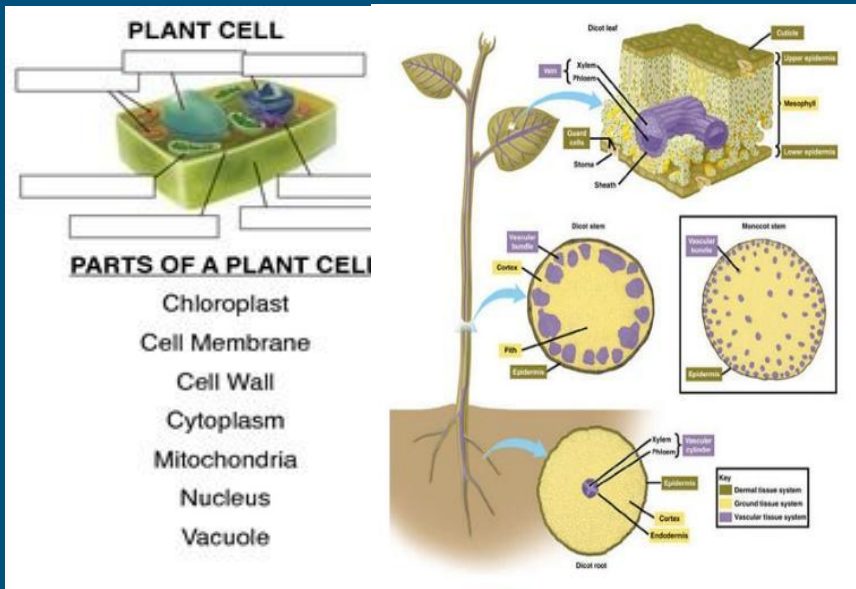


First Peoples Principles of Learning

- Students will learn about fun and interesting Canadian and British Columbia plants that have adapted to survive and interact within their environment (land). Students will reflect on Indigenous knowledge throughout history versus traditional science. Students will practice patience, knowing that building creative skills and growing knowledge requires time.
- Students will explore the various uses of local plants and will learn how this knowledge is passed down from one generation to the next. Grateful recognition will be given that this knowledge has been shared through the Footprints in Stone site through the Quesnel Museum. Students will learn from local Lhtako Dené Elder, Ellie Peters through a short video.
- A bridge will be made connecting the similarities between communities of trees and communities of people, including the generational influence and impacts and consequences of individual actions. There will be a field trip to the Ancient Forest, at the end of the unit, which will allow for the exploration of these connections and the sense of place within one of the region's old-growth forests. Stories will be shared within this land on the field trip and ask a local First Nation Elder to join us and share knowledge of the land.

Lesson 1 & 2 and the Plant Biology Self-Assessment Project

Developing Biology Knowledge & Vocabulary, Plant Parts and Processes
 Creating a summative Comic Strip to showcase student learning to date.



Lesson 3: Plant organ systems enable them to survive and interact within their environment

Students learn about Carnivorous Plants
- 2021 Discovery in British Columbia

Create Your Own Plant Project!

Co-created Proficiency Scale Rubric for
Student Self-Assessment and Teacher
Summative Assessment.



Lesson 4: Medicinal uses of plants by Dakelh (South Carrier) People - “Local Plants”



This lesson introduces students to local plants and their uses by the Southern Carrier (Dakelh) people. As a class today, we will engage in a condensed version of the activity that is part of the lesson in order to gain familiarity with uses of some local plants and their Carrier name.

“Reclaiming the Land”

Before we participate in the activity, we will watch a short section of video. This video is a small section of a longer video entitled “Reclaiming the Land,” highlighting the Lhtako Dené people from the Quesnel area. The section we will watch shows Ellie Peters, a local elder, collecting juniper branches and explaining its uses.

<https://youtu.be/Cq0-Tl1sP0Q> (6:50-9:20)



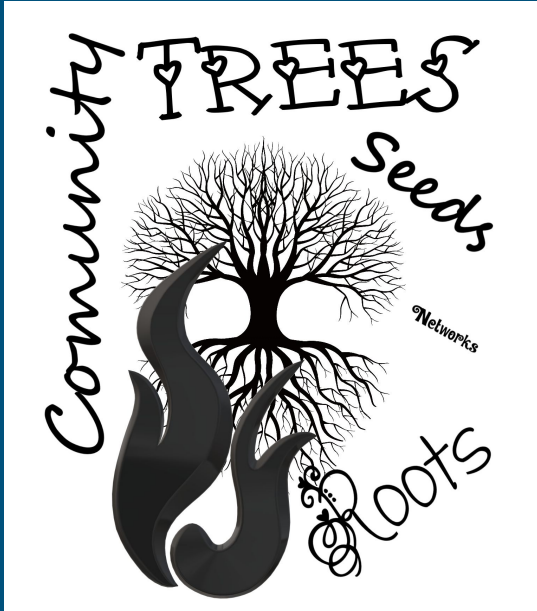
Local Plant Research Activity



<https://www.quesnelmuseum.ca/FootprintsInStone/index02.html>

1. Form groups of 2 to 4 Teacher Candidates
2. Each group will be assigned a local plant
3. Google Search: Footprints in Stone (Quesnel Museum)
4. Research Carrier Name and One Use of Plant for Sharing
5. Five Groups will be randomly selected to share

Lesson 5: The Social Community of Trees and How They Work Together Within the Forest



Engagement Activity - Doodle Notes

1. Doodle/Sketch as inspired from the Video Presentation
2. Include keywords that you hear in the video.

(This activity is included in the Unit Plan Lesson 3.)

What Trees Talk About

12 min Video

https://www.youtube.com/watch?v=_LFvL_iYVaY

This video introduces the complexity of trees in a forest community and sheds light on just how important each tree (and generation of trees), as well as each plant, is to the survival of another. It also signifies the tremendous responsibility that we have to ensure that our forests stay intact for our future and that of our children.



How Trees Secretly Talk to Each Other in The Forest

3:41 min Video

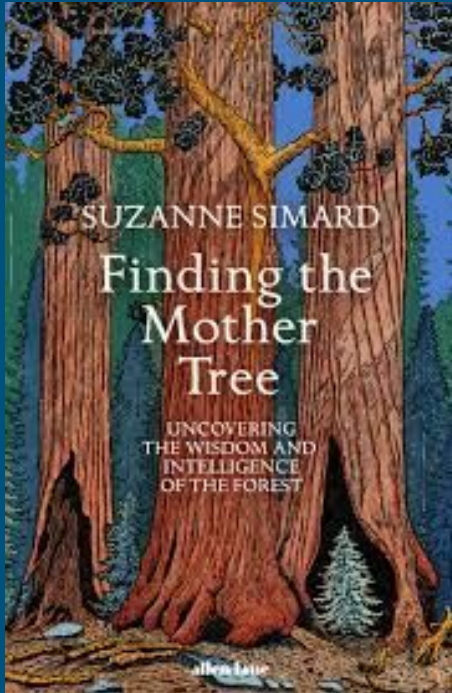
https://www.youtube.com/watch?v=7kHZ0a_6TxY

This video introduces the symbiotic relationships that trees have with one another as well as fungi that support communication and mutualism of the forest ecosystem.



Finding the Mother Tree

Reading pp. 4-7



“ No one has done more to transform our understanding of trees than the world-renowned scientist **Suzanne Simard**. Now she shares the secrets of a lifetime spent uncovering startling truths about trees: their cooperation, healing capacity, memory, wisdom and sentience.

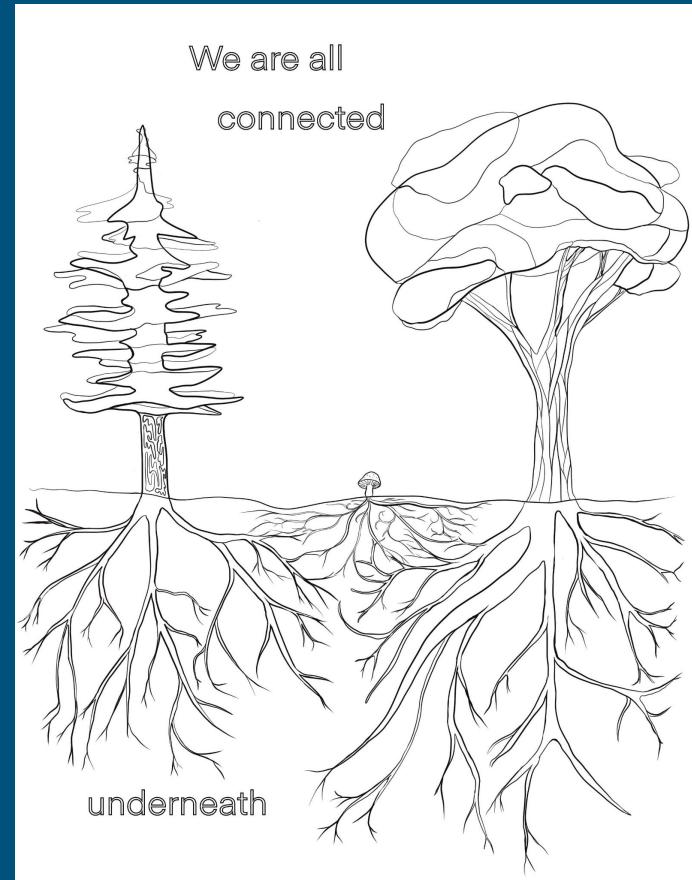
In *Finding the Mother Tree*, she reveals how the complex cycle of forest life - on which we rely for our existence - offers profound lessons about resilience and kinship, and must be preserved before it's too late'.”

Kate Kellaway, Observer

***Sentience** is the capacity to experience feelings and sensations.* Wikipedia, 2022

Provocation:

**How could we as humans be
more
interconnected and mutualistic
like trees and plants
in community?**





Thank you

Questions?



References

Baker Creek Enhancement Society. (n.d.). [Website]. <https://bakercreek.org/our-purpose/outdoor-classroom/>

BC Parks (n.d.) *Ancient Forest/Chun Toh Whudujut Provincial Park*. [Webpage]. [bcparks.ca](https://bcparks.ca/explore/parkpgs/ancient-forest/). Retrieved on February 4, 2022, from <https://bcparks.ca/explore/parkpgs/ancient-forest/>

Beaton, J. (Director). (2008). *Teachings of Respect, Dr. Nancy Turner, UVic Ethnobotanist*. [Film]. Open School BC. Retrieved on February 4, 2022, from https://www.openschool.bc.ca/elementary/my_seasonal_round/lesson_2.html

Campbell, B. (n.d.). *Plant Cell Quiz*. [Worksheet] [teacherspayteachers.com](https://www.teacherspayteachers.com/Product/Plant-Cell-Quiz-1096728?st=59b76d163b17c45cb449280684e5b5fe) <https://www.teacherspayteachers.com/Product/Plant-Cell-Quiz-1096728?st=59b76d163b17c45cb449280684e5b5fe>

Drollinger, M. [Mark Drollinger]. (2014, September 11). *Unicellular and Multicellular*. [Video]. YouTube. <https://www.youtube.com/watch?v=9iqeAdJ01UQ>

Education Galaxy. (2020, June 9). *5th Grade - GA Science - Plant and Animal Cells - Topic Overview*. [Video]. YouTube. <https://www.youtube.com/watch?v=G9gSZ1Ta73E&t=33s>

First Peoples' Cultural Foundation. (2000-2020). *Dakelh/Southern Carrier Alphabet*. [Webpage]. [firstvoices.com](https://www.firstvoices.com/explore/FV/sections/Data/Athabaskan/Dakelh/Dakelh%20%20Southern%20Carrier/learn/alphabet). Retrieved on March 26, 2022, from <https://www.firstvoices.com/explore/FV/sections/Data/Athabaskan/Dakelh/Dakelh%20%20Southern%20Carrier/learn/alphabet>

References

Gabbatis, J. (2020, May 15). *Can the Wood-wide Web Really Help Trees Talk to Each Other?* [Article]. BBC Science Focus Magazine. <https://www.sciencefocus.com/nature/mycorrhizal-networks-wood-wide-web/>

Glussy Science. (n.d.). *Build a Cell: 3D Jello Animal and Plant Cell Models*. [Worksheet]. teacherspayteachers.com <https://www.teacherspayteachers.com/Product/Build-a-Cell-3D-Jello-Animal-and-Plant-Cell-Models-2884827?st=59b76d163b17c45cb449280684e5b5fe>

Google. (n.d.) [Google Map directions from Quesnel, BC to the Ancient Forest]. Retrieved on February 4, 2022, from <https://www.google.com/maps/dir/Quesnel,+British+Columbia/Ancient+Forest+Recreation+Site,+Fraser-Fort+George+F,+BC/@53.4636734,-122.5094399z/am=t/data=!4m13!4m12!1m5!1m1!1s0x538705ef9570a739:0x50135152a7b2230!2m2!1d-122.4949058!2d52.9817372!1m5!1m1!1s0x5385c1516477f347:0x3a39b4b8c2ec04af!2m2!1d-121.2187244!2d53.7629956>

Hunka, R. (Director). (2017). *What Trees Talk About: A revealing look at the secret life of trees - The Nature of Things*. [Documentary]. Merit Motion Pictures. YouTube. Retrieved March 12, 2022, from https://www.youtube.com/watch?v=LFvL_jYvAY

Infinity Sci. (2021, October 3). *3D Plant Cell Organelles and Their Functions*. [Video]. YouTube. <https://www.youtube.com/watch?v=BFwXNpUw-AA>

References

Kellaway, K. (n.d). [Review of the book *Finding the Mother Tree: Uncovering the Wisdom and Intelligence of the Forest* by S. Simard]. Penguin Book UK. Retrieved February 12, 2022, from <https://www.penguin.co.uk/books/312242/finding-the-mother-tree/9780241389348.html>

Morash, M. (Director). (2021). *Reclaiming the Land*. [Film]. One Island Media. YouTube. Retrieved on February 4, 2022, from <https://youtu.be/Cq0-Tl1sP0Q>

My Free Bingo Card Generator. (n.d.) [Website]. myfreebingocards.com. Retrieved February 4, 2022, from <https://myfreebingocards.com/bingo-card-generator>

NationalGeographic. (2018, September 11). *How Trees Secretly Talk to Each Other in the Forest | Decoder*. [Video]. Lauren Leadmon (Producer). YouTube. Retrieved March 12, 2022, from https://www.youtube.com/watch?v=7kHZ0a_6TxY

NaturalistOutreach. (2014, May 6). *Carnivorous Plants*. [Video]. YouTube. <https://www.youtube.com/watch?v=-iHlKhKCq6E>

Nature Science for Kids by Smile and Learn. (2019, January 9). *Photosynthesis in Plants for Children*. [Video]. YouTube. <https://www.youtube.com/watch?v=eAtmq8lhcUs>

Patrick, D. (n.d.) *Footprints in Stone, Nek'oh Tse K'ut*. [Website]. quesnelmuseum.com. Retrieved March 10, 2022, from <https://www.quesnelmuseum.ca/FootprintsInStone/index02.html>

References

Romaine, J. (2021, August 11). *Scientists Discover Common Flower is Carnivorous*. [Video]. thehill.com. <https://thehill.com/changing-america/sustainability/environment/567371-scientists-discover-common-flower-is-carnivorous>

Science Skool. (2018, September 9). *Plant Cells Under the Microscope*. [Video]. YouTube. <https://www.youtube.com/watch?v=7TFNK11U2xU&t=83s>

Simard, S. (2021). *Finding the Mother Tree: Uncovering the Wisdom and Intelligence of the Forest*. Penguin Books.

Sturt, K., & Hollowell, S. (2020, September 3). *Watch out for the plants! Plant adaptations and uses units*. [Website]. shareedbc.ca Retrieved on March 26, 2022, from <https://www.shareedbc.ca/resources/9dda3075-a7e3-4591-87ef-08d8333b30be>

Tig Tag World. (n.d.) Parts of a Plant. [Video]. tigtagworld.com <https://www.tigtagworld.com/film/embed/parts-of-a-plant-PRM00096/>

Wikimedia Foundation. (2022, March 23). *Sentience*. Wikipedia. [Webpage]. Retrieved March 27, 2022, from <https://en.wikipedia.org/wiki/Sentience>

Photo/Image Credits

Ancient Forest x 3. [Photographs]. Hesslegrave, J. (2021).

Doodle Notes. [Image]. 3D Paint. McManus, S. (2022).

Ellie Peters. [Photograph]. Retrieved on March 6, 2022, from <https://www.quesnelobserver.com/community/elders-history-a-labour-of-love/>

Layers of Leaf Structure. [Image]. Retrieved on February 4, 2022, from <https://biology-igcse.weebly.com/leaf-structure.html>

West Fraser Timber Park. [Photograph]. von Hanh, M. (2021).

Meristematic Tissue. [Image]. Retrieved on February 4, 2022 from <https://www.snapsolve.com/solutions/Which-of-the-following-statements-are-correct-about-meristematic-tissues-1-compo-1692647392420866>

Plant Tissues. [Image]. Retrieved on February 4, 2022, from https://www.ck12.org/book/cbse_biology_book_class_9/section/2.2/

Tree with Roots. [Image]. Retrieved on February 4, 2022, from <https://creazilla.com/nodes/21967-tree-with-roots-clipart>

Venus Fly Trap. [Image]. Retrieved on February 4, 2022, from <https://www.alamy.com/stock-photo-freehand-drawn-black-and-white-cartoon-venus-fly-trap-101075251.html>