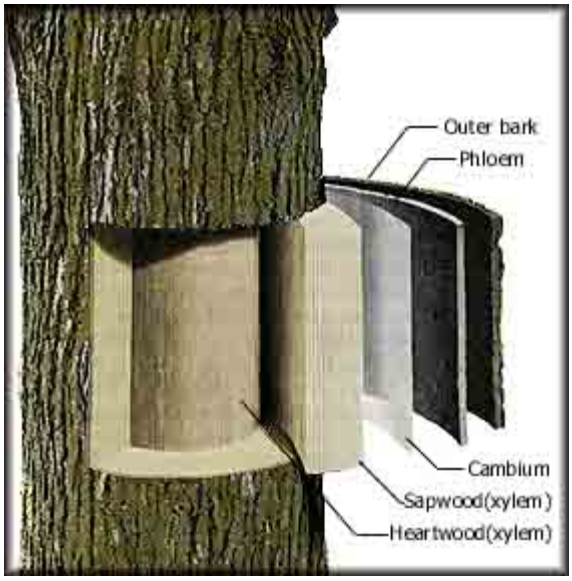
Tree basic needs

LaCuKnoS Language Booster

Trees are living **organisms**. As such, trees need air, water, nutrients (food), energy, and space to live. But, do you know how trees get these **basic needs** from the environment? Trees have specialized parts to meet their basic needs and give them support and protection from the environment.

Trees have root systems with woody roots and vast numbers of small roots. Trees use the small roots to *absorb nutrients* and water from the soil. Large woody roots secure the tree in the soil and *transport* water and nutrients.

Trees use their leaves for *gas exchange*. Leaves take in carbon dioxide and release oxygen. Also, they gather energy from the sunlight to convert carbon dioxide and water into sugars. During this process called **photosynthesis**, leaves produce food energy for the tree.



Forming a connection between the roots and the tree's top, or crown, there is a well-defined and woody trunk. The trunk provides *support* to the tree by holding the branches and leaves. It also *transports* food and water. The trunk has multiple layers to perform different functions.

The outer layer is the bark. It gives *protection* to the tree against fire, disease, intense temperatures, and mechanical harm. The next layer is the **phloem** (FLOW-uhm). This layer *transports* food within the tree. Next is the cambium (KAM-bee-uhm), which is composed of living cells that actively divide and cause the trunk to grow wider over time. Next, the **xylem** (ZEYE-luhm), also called sapwood, is formed by cells that transport water and nutrients from the roots to the leaves. Finally, the heartwood is in the center of the tree. The primary function of heartwood is to provide strength. The heartwood is the part that most clearly shows annual growth rings.

Watch this video thats looks inside a tree to figure out what's going on in there:
Forest Fact Break: Tree Biology
(https://www.youtube.com/watch?v=VDSFck-h8D4)

Talk with your partner about these questions, then write your answers.

Go outside or look out the window and observe any trees you can see. What do you think trees have in common with humans and what makes them different?

Image from Virginia Tech. (n.d.). *A Tree and Its Trunk page 2*. The Forestry Outreach Site FORSite. Retrieved December 23, 2021, from https://dendro.cnre.vt.edu/Forsite/tait2.htm

If I Were a Tree

LaCuKnoS Science Investigation

In this activity we all are going to be trees as we explore what humans and trees have in common. Trees are tall plants with woody tissue that have a well-defined trunk, a crown, and roots. In this activity we will be exploring how the different parts of the tree have similar functions as human parts and how trees have similar **basic needs** as humans.

Materials

- big piece of paper to trace student body
- markers
- a laminated picture of a tree
- wet erase markers
- Human and trees hand-out (optional)

Procedure:

1. Review the language booster and what you learned about the functions of different tree parts, such as transportation of nutrients and protection, that help trees to meet their needs.
2. You and a partner will get a laminated picture of a tree and an erasable marker.
3. Use the erasable marker to label the parts of the tree including its function that it uses to meet its needs. Use the language booster to help you.
4. Next, use the large paper and a marker to draw an outline of your body.
5. Discuss with your partner what parts of your body have similar functions as tree parts that help you to meet the same basic needs as the tree.
6. Draw the parts/organs that you think have similar functions as tree parts.
7. Label them including their functions.

If I were a Tree Concept Mapping Activity

In the last part of this activity, you will work with a partner to create a concept map to show your understanding of the following topic: *How are humans and trees similar and different?*

Step 1—Partner discussion. Start by discussing the following questions with your partner:

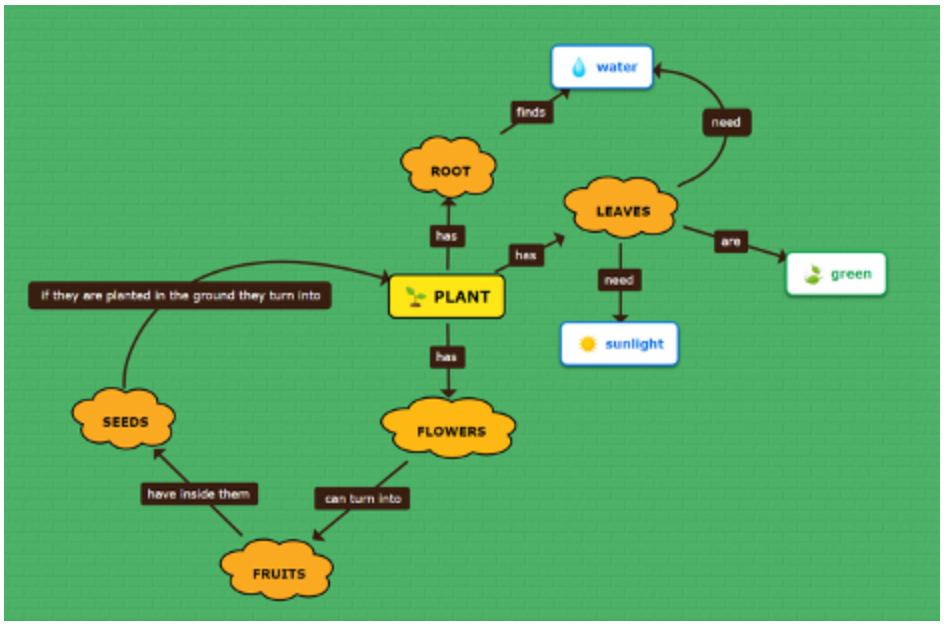
- What are the main ideas we should include in our concept map about How humans and trees are similar and different? List your main ideas below. The list already has a few concepts you may want to include. What other ones should you add?
- What are the relationships between these main ideas? How are they connected?

List of main ideas for our concept map	Notes on how these ideas are connected
• Protection • Support • Absorption of nutrients • Transport of materials • Gas exchange	• humans organs and trees parts have some of the same functions • human skeleton has protection function like tree bark

Step 2—Create your own individual concept map. After your partner discussion, use a blank sheet of paper to create your own concept map about how humans and trees are similar and different. Be sure to include the main ideas you listed and how these ideas are connected to each other.

Feeling stuck? These questions might help you get started.

- What is the most important idea that should go in the middle of your concept map?
- Do humans and trees protect themselves in the same way? Why or why not?
- How do humans and trees get the nutrition they need to survive?
- Below is an example of what a concept map can look like. This one is about the parts of a plant but it can give you ideas about how to draw your concept map.



Step 3— Share and discuss your concept maps with a partner. After you finish your individual concept map, share and discuss your map with your partner or small group. Look for similarities and differences between your concept map and theirs. Why do you think your maps are not exactly the same? If you want to, you can use a second color to make changes or additions to your concept map.

Step 4— Put your name on your concept map and turn it in to your teacher.

If I were a tree

LaCuKnoS Concept Cards

Organism/Organismo

a body made up of organs or other parts that work together to carry on the various processes of life.

un cuerpo formado por órganos u otras partes que trabajan juntas para llevar a cabo los diversos procesos de la vida.

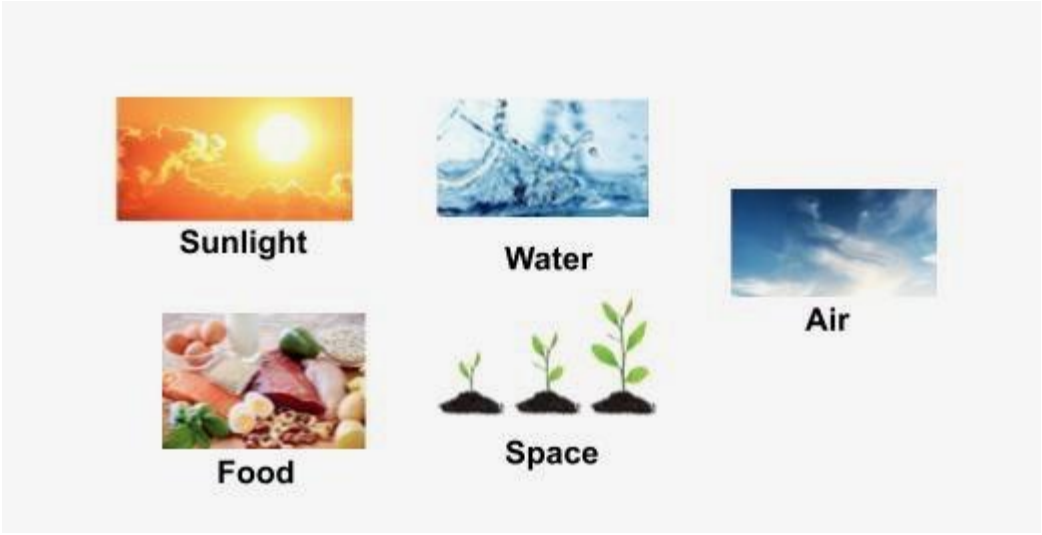
Dogs need to eat and breathe. They are organisms.

Concept Card

Basic needs/
Necesidades básicas

Things that an organism must have in order to survive, such as nutrition and protection.

Cosas que un organismo debe tener para sobrevivir, como nutrición y protección.



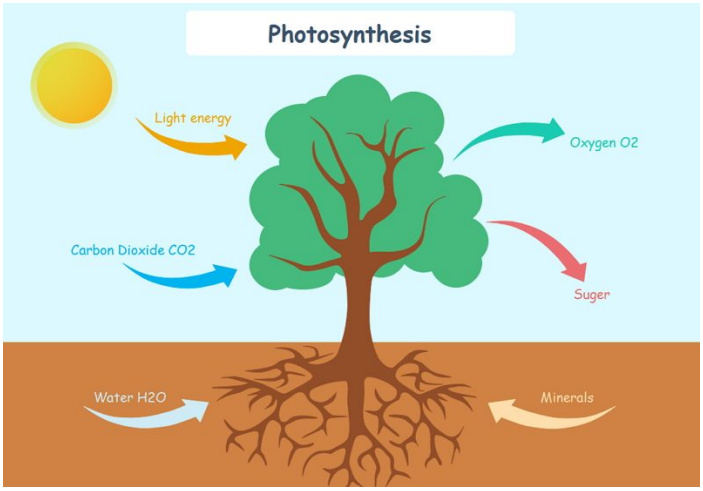
Food and water are basic needs of animals and plants.

Concept Card

Photosynthesis/
Fotosíntesis

Photosynthesis is the process in which green plants use sunlight to make their own food.

La fotosíntesis es el proceso en el que las plantas verdes utilizan la luz solar para producir su propio alimento.



Source:Edraw Max

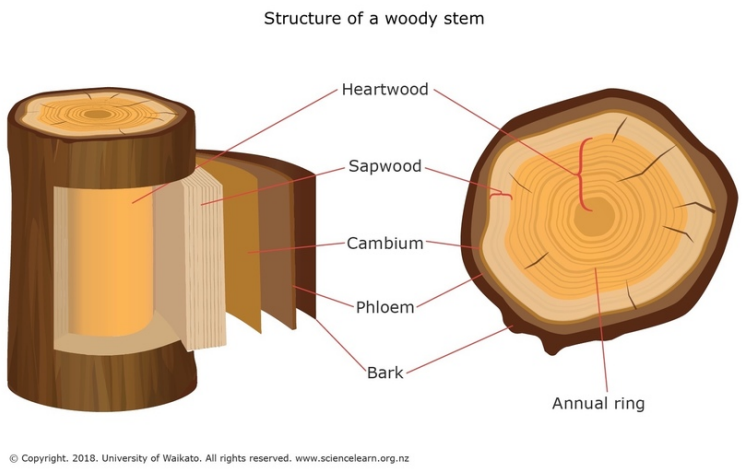
Plants release oxygen during photosynthesis.

Concept Card

Xylem/Xilema

The layer in the trunk of a tree that carries water and nutrients absorbed from the soil by the roots to the leaves.

La capa en el tronco de un árbol que transporta el agua y los nutrientes absorbidos del suelo por las raíces a las hojas.



The xylem transport water from the roots to the leaves

Concept Card

Phloem/Floema

It carries water and the sugar made in the leaves down to other parts of the tree, such as roots, stems, and flowers.

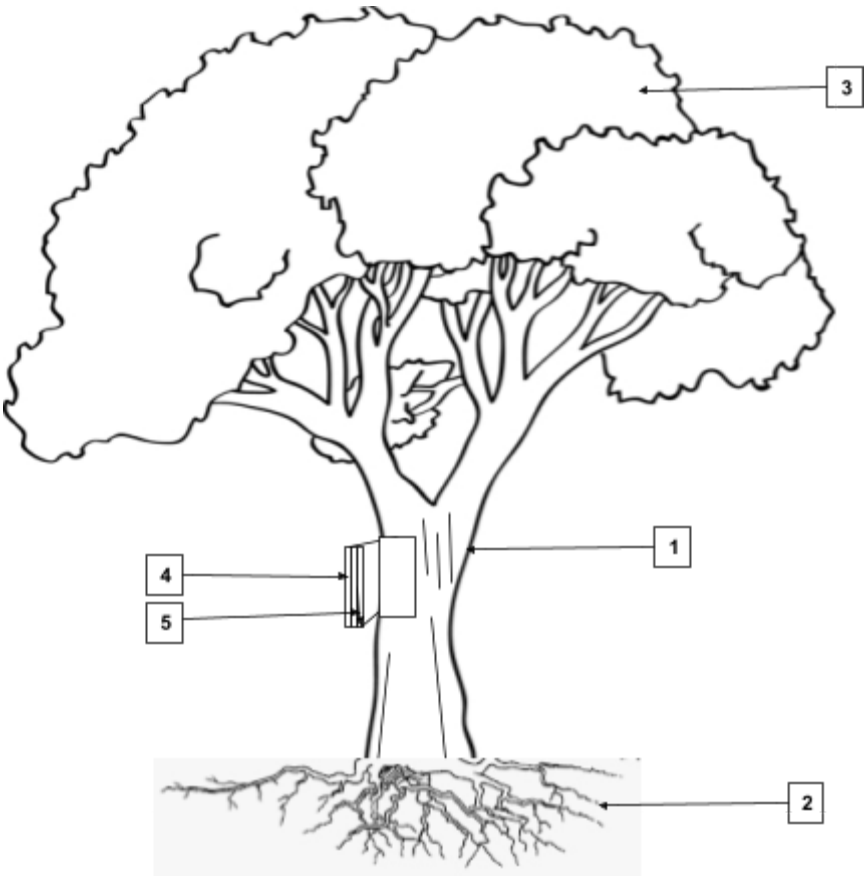
Transporta el agua y el azúcar de las hojas a otras partes del árbol, como raíces, tallos, y flores.

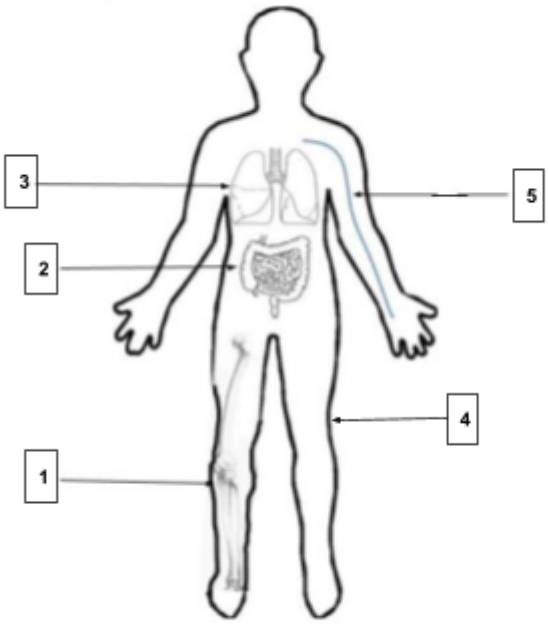
Tony Andersen, Oregon Department of Forestry AP

The phloem transports food that is produced during photosynthesis.

Concept Card

Humans and Trees





Trees/Human Parts

Write the tree/human parts in the appropriate blanks on the pictures above

Trunk	**Xylem/Phloem**	**Skin**	**Bark**	**Roots**
Lungs	**digestive system**	**Skeletal System**	**Leaves**	**Veins/Arteries**

Trees/Human Functions

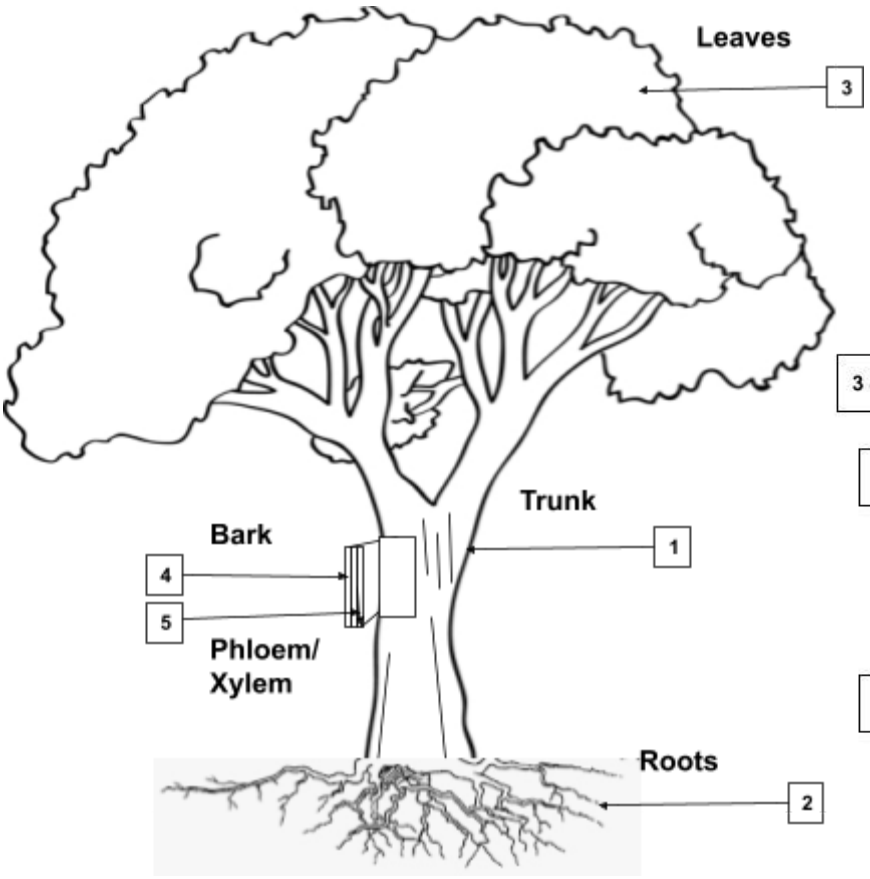
Match numbers 1 through 5 in the pictures above to the functions below.

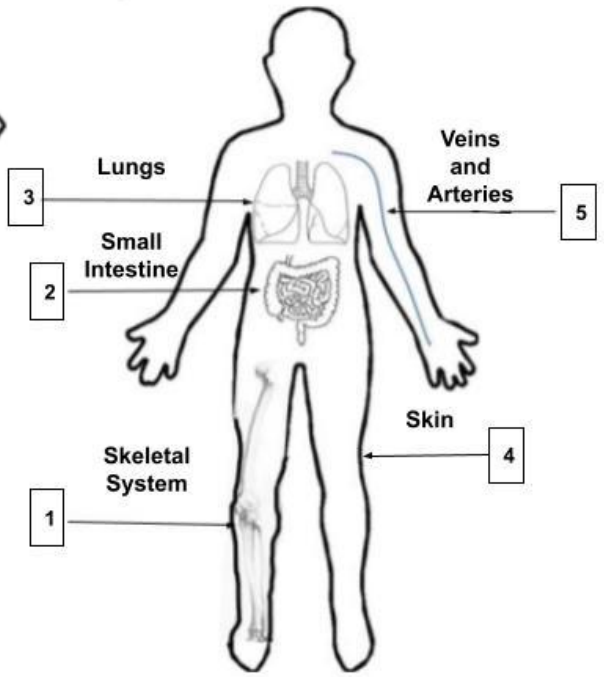
_____Protection _____Support _____Get Nutrition

_____Transport nutrients _____ Gas exchange

Modified from Lesson 1. Me as a Tree. The Wisconsin K-12 Forestry Education Program. 5-6 UNIT Wisconsin K-12 Forestry Lesson Guide, 2004.

Humans and Trees





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Trees/Human Functions

Match numbers 1 through 5 in the pictures above to the functions below.

____4_____Protection ____1_____Support _____2_____Get Nutrition

_____5_____Transport nutrients ____3_____ Gas exchange

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