

LESSON PLAN TITLE: Christmas Tree Adaptations

SUBJECT/COURSE:	Science/Language Arts
TOPIC:	Adaptations of conifers to help them survive winter as they relate to being a Christmas tree
GRADE LEVEL:	6 th -8 th
TIME REQUIREMENT:	One 60-minute session

LESSON OBJECTIVES:

Students will understand the term “adaptation.”

Student will use the term “inference.”

Student will use inference as a reading skill to determine the relationship between the adaptations of a conifer and why they are selected as Christmas trees.

CORE STANDARDS ADDRESSED:

*Math and Language Arts Standards are from the Common Core
Science Standards are from the Washington State Science Standards*

6.L.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

6. RI.1 Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

6-8 LS1D Both plant and animal cells must carry on life functions, so they have parts in common, such as nuclei, cytoplasm, cell membranes, and mitochondria. But plants have specialized cell parts, such as chloroplasts for photosynthesis and cell walls, which provide plants their overall structure.

6-8 LS3E Adaptations are physical or behavioral changes that are inherited and enhance the ability of an organism to survive and reproduce in a particular environment.

VOCABULARY:

- Inference/infer
- Adaptations
- Deciduous
- Conifer
- Dormant
- Photosynthesis
- Chlorophyll
- Glucose
- Carbon dioxide
- Oxygen
- Metabolism

SUMMARY OF TASKS/ACTIONS:

Read the opening to *Christmas Tree Adaptations* with your class. You may choose to either read the remainder of the piece with your students, modeling what would be important pieces to highlight and then record these pieces on the reference log or allow your students to attempt the task independently. Review the *Inference Log* with the students and discuss the inferences they may make from their reading about why the adaptations of conifers allow for them to be good candidates for Christmas trees. This would also be a good time to review photosynthesis with a simple drawing diagram. A formative assessment would be to have students draw a picture of a conifer tree on the back of their inference log and label the adaptations on the tree that make conifers excellent Christmas trees.

MATERIALS NEEDED:

- Highlighter for each student
- A copy of *Christmas Tree Adaptations* for each student.
- A copy of *Inference Log* for each student
- A teacher copy of *Christmas Tree Adaptations*
- A teacher copy of *Inference Log*

REFERENCES NEEDED:

NONE

NAME: _____



Oh Christmas tree, oh Christmas tree

How lovely are your branches....

Really – why are they so lovely?

Read on!

Have you ever wondered why it is that evergreen trees, called conifers, have traditionally been used as Christmas trees? Why not palm trees or maples? What is so special about conifers anyway?

All conifers have several special adaptations that help them survive the long, cold winter months. Adaptations are simply the physical structures and processes that a plant or animal has which allow them to survive in a certain habitat. For instance, tigers have sharp claws and teeth as adaptations that help them catch prey. A tiger also has stripes as an adaptation to help camouflage itself in the jungle.

DIRECTIONS

Use your critical reading skills as you highlight the important information in the following paragraphs to determine what adaptations conifers have that make them perfect Christmas trees. You will be using your highlighted selections to infer why the adaptations of conifers help make them the perfect candidate for a Christmas tree. Remember, you are only to highlight the sentences and phrases that give you clues about why the adaptations conifers have also help make them good Christmas trees. Good luck!



CHRISTMAS CONIFERS

All of the trees selected are conifers. This means they produce cones. They are also called evergreens, which means they have needles that remain on the tree all year round. There are other conifers that lose their needles each year, including larch. These would most certainly not make a good Christmas tree!

The needles on a conifer are like the leaves on a deciduous tree (trees that lose their leaves every fall). The needles help the tree make food for itself using water and carbon dioxide. The water is taken into the tree from the trees roots. Carbon dioxide is in the air that all animals breathe out. The needles have tiny pores on them called stomata that allow carbon dioxide in. The needles are green due to the chlorophyll contained within them. The chlorophyll is where the energy from sunlight is used to turn water and carbon dioxide into glucose (food) for the tree to use. The chlorophyll in a conifer is present all year round and keeps a tree green for a long time, even after the tree is cut.

As trees make glucose for themselves, they produce oxygen. Humans and all other animals are able to breathe in this oxygen as it becomes a part of the air. The oxygen is able to leave the needles of the conifer through the stomata. The process of using water and carbon dioxide to create food for a plant is called photosynthesis.

Since most conifers do not lose their needles in the fall, they can still photosynthesize all winter long. They do not go fully dormant during the long winter months, but do have a reduction in photosynthesis. This means the metabolism of the tree slows down considerably. Metabolism is the process by which an organism burns energy. Since the metabolism of a conifer slows way down, the tree takes a long time to die once it is cut.

Lastly, conifers face the task of having to withstand heavy snow loads. The snow that accumulates on an individual tree can weigh hundreds of pounds! The natural, overall cone-shape of conifers allows for snow to slough off more easily than a deciduous tree. The internal fibers of the wood are also much longer than a deciduous tree and allow for the branches to bend much further without breaking.

For all of these reasons, conifers make perfect trees to cut, bring inside a warm house and upon which to hang heavy ornaments. Not to mention, they are simply delightful to smell and gorgeous to behold!

INFERENCE LOG

SUMMARY OF ITEM HIGHLIGHTED	WHY THIS ADAPTATION MAKES A CONIFER A GOOD CHRISTMAS TREE
EXAMPLE: Produce cones.	EXAMPLE: Christmas trees are pretty with cones on it.

NAME: _____



*Oh Christmas tree, oh Christmas tree
How lovely are your branches....
Really – why are they so lovely?
Read on!*

Have you ever wondered why it is that evergreen trees called conifers have traditionally been used as Christmas trees? Why not palm trees or maples? What is so special about conifers anyway?

All conifers have several special adaptations that help them survive the long, cold winter months. Adaptations are simply the physical structures and processes that a plant or animal has which allow them to survive in a certain habitat. For instance, a tiger has sharp claws and teeth as adaptations that help them catch prey. A tiger also has stripes as an adaptation to help camouflage itself in the jungle.

DIRECTIONS

Use your critical reading skills as you highlight the important information in the following paragraphs to determine what adaptations conifers have that make them perfect Christmas trees. You will be using your highlighted selections to infer why the adaptations of conifers help make them the perfect candidate for a Christmas tree. Remember, you are only to highlight the sentences and phrases that give you clues about why the adaptations conifers have also help make them good Christmas trees. Good luck!



CHRISTMAS CONIFERS

All of the trees selected are conifers. This means they **produce cones**. They are also called evergreens, which means they **have needles that remain on the tree all year** round. There are other conifers that lose their needles each year, including larch. These would most certainly not make a good Christmas tree!

The needles on a conifer are like the leaves on a deciduous tree (trees that lose their leaves every fall). The needles help the tree make food for itself using water and carbon dioxide. The water is taken into the tree from the trees roots. Carbon dioxide is in the air that all animals breathe out. The needles have tiny pores on them called stomata that allow carbon dioxide in. **The needles are green due to the chlorophyll contained within them**. The chlorophyll is where the energy from sunlight is used to turn water and carbon dioxide into glucose (food) for the tree to use. **The chlorophyll in a conifer is present all year round and keeps a tree green for a long time, even after the tree is cut.**

As trees make glucose for themselves, they produce oxygen. Humans and all other animals are able to breathe in this oxygen as it becomes a part of the air. The oxygen is able to leave the needles of the conifer through the stomata. The process of using water and carbon dioxide to create food for a plant is called photosynthesis.

Since most conifer trees **do not lose their needles in the fall**, they can still photosynthesize all winter long. They do not go fully dormant during the long winter months, but do have a reduction in photosynthesis. This means the metabolism of the tree slows down considerably. Metabolism is the process by which an organism burns energy. **Since the metabolism of a conifer slows way down, the tree takes a long time to die once it is cut.**

Lastly, conifers face the task of having to withstand heavy snow loads. The snow that accumulates on an individual tree can weigh hundreds of pounds! **The natural, overall cone-shape of conifers allows for snow to slough off more easily** than a deciduous tree. **The internal fibers of the wood are also much longer than a deciduous tree and allow for the branches to bend much further without breaking.**

For all of these reasons, conifers make perfect trees to cut, bring inside a warm house and upon which to hang heavy ornaments. Not to mention, they are simply delightful to smell and gorgeous to behold!

INFERENCE LOG

SUMMARY OF ITEM HIGHLIGHTED	WHY THIS ADAPTATION MAKES A CONIFER A GOOD CHRISTMAS TREE
Produce cones.	Christmas trees are pretty with cones on it.
Needles all year round.	Needles make the tree pretty and holds ornaments in place.
Needles are green because of chlorophyll.	Green trees are pretty and make the tree look alive still.
Chlorophyll makes the tree green for a long time, even after it is cut.	The tree looks alive for a long time.
Needles are not lost.	Needles make the tree pretty and holds ornaments in place.
Metabolism slows way down.	Tree takes a long time to die. Looks pretty and green.
Natural, overall cone-shape of conifers allows for snow to slough off easily.	Tree can fit in your house. Not like an apple or maple tree.
Internal fibers of the wood are longer and allow for the branches to bend much further without breaking.	Branches can hold heavy ornaments.

NOTE: SOME INFERENCES MAY NOT BE LISTED AS TEACHERS SHOULD USE THEIR DISCRETION AS TO THEIR SOUNDNESS IN LOGIC.