GRADE 6 SCIENCE: TREES & FORESTS

Group Members: Alysia Ackerman, Amanda Bjorge, Dana Somerville & Dru Perry

EDES 365: Gord Strowbridge

November 12, 2014
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Attached:

Lessons (Fully Developed)

One

Two

Three (Performance Task Rubric & Checklist)

Traditional Unit Test

Traditional Unit Test Answer Key.
## Advance Preparation

Preparations & Considerations to be made PRIOR to starting this unit:

- As with any other unit, you should be familiar with the Program of Studies before beginning.
- Planning ahead is crucial. Make sure field trips and buses are booked early (ex: Des Crossley, Bower Ponds) and permission forms are sent home in plenty of time.
- All resources need to be printed and prepared on time for the lessons.
- Prepare your classroom and materials.
- Be familiar with the technology you will use in this unit. Preview all websites and videos prior to use.
- On the following pages you will find vocabulary needed to teach this unit.
- You will need supervisors for the trip to Bower Ponds as well as enough ipads or cameras for each group to have one.
### Part 1 - Logistics

<table>
<thead>
<tr>
<th>Unit Title / Essential Question:</th>
<th>Instructional Designers:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trees and Forests: <em>How are trees and forests valuable to our world?</em></td>
<td>Alysia Ackerman, Amanda Bjorge, Dana Somerville &amp; Dru Perry</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subject Area(s):</th>
<th>Grade:</th>
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<tbody>
<tr>
<td>Science</td>
<td>6</td>
</tr>
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<table>
<thead>
<tr>
<th>Curriculum Strand(s):</th>
<th>Duration:</th>
</tr>
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<tbody>
<tr>
<td>General Learner Expectations: 6-1, 6-2, 6-3, 6-4, 6-10</td>
<td>36 Classes: 40-45 minutes each</td>
</tr>
<tr>
<td>Specific Learner Expectations: 1-10</td>
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### Overview and Rationale:

Trees & Forests is a great unit to start the year off with because the weather is still nice enough that the students can be taken outside to examine nature. This time of year also makes it easier for the students to view and understand the changes taking place, which gives them a better understanding of the differences between deciduous and coniferous trees. The students will learn how to recognize different types of trees, branches and leaves and how they exist within a forest ecosystem. They will also study the characteristics of trees, branches and leaves and learn to interpret the growth patterns of trees. The students will become aware of a range of environmental issues such as deforestation, recycling and global warming, and will gain an awareness of the interaction between trees, forests and humans. They will also learn about the kinds of plants and animals that live in forests and how they play a part in the nutrient cycles. The beginning of the year is also an ideal time to take the students on meaningful local outings and field trips, such as a field trip to Des Crossley, to get them excited about science and the coming year!

### Prior Knowledge:

Students need to have a firm understanding of the Weather Watch and Wetland Ecosystems units from Grade 5. Trees & Forests has a Science Inquiry focus which stems from the Weather Watch and Wetland Ecosystems units, which also has a Science Inquiry focus.
### Learning Outcomes:

#### General Learner Expectations

*Students will:*

1. Design and carry out an investigation in which variables are identified and controlled, and that provides a fair test of the question being investigated.
2. Recognize the importance of accuracy in observation and measurement; and apply suitable methods to record, compile, interpret and evaluate observations and measurements.
3. Design and carry out an investigation of a practical problem, and develop a possible solution.
4. Demonstrate positive attitudes for the study of science and for the application of science in responsible ways.
5. Describe characteristics of trees and the interaction of trees with other living things in the local environment.

#### Specific Learner Expectations

*Students will:*

1. Identify reasons why trees and forests are valued. Students meeting this expectation should be aware that forests serve as habitat for a variety of living things and are important to human needs for recreation, for raw materials and for a life-supporting environment.
2. Describe kinds of plants and animals found living on, under and among trees; and identify how trees affect and are affected by those living things.
3. Describe the role of trees in nutrient cycles and in the production of oxygen.
4. Identify general characteristics that distinguish trees from other plants, and characteristics that distinguish deciduous from coniferous trees.
5. Identify characteristics of at least four trees found in the local environment. Students should be familiar with at least two deciduous trees and two coniferous trees. Examples should include native species, such as spruce, birch, poplar, and pine and cultivated species, such as elm and crab apple.
6. Describe and classify leaf shapes, leaf arrangements, branching patterns and the overall form of a tree.
7. Interpret the growth pattern of a young tree, distinguishing this year’s growth from that of the previous year and from the year before that. Students meeting this expectation should recognize differences in colouration and texture of new growth and
old growth, and locate scars that separate old and new growth.
8. Identify human uses of forests, and compare modern and historical patterns of use.
9. Identify human actions that enhance or threaten the existence of forests.
10. Identify an issue regarding forest use, identify different perspectives on that issue, and identify actions that might be taken.

**Cross-curricular competencies:**
*Identify and describe how students will develop at least 2 competencies as part of this project.*

<table>
<thead>
<tr>
<th>C: Identify and Solve Complex Problems</th>
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<tbody>
<tr>
<td><strong>C1: Generate solutions to complex problems.</strong></td>
</tr>
<tr>
<td>● C1.1: I identify and clarify problems.</td>
</tr>
<tr>
<td>● C1.2: I establish clear criteria to make informed decisions or solve problems.</td>
</tr>
<tr>
<td>● C1.3: I explore and apply problem-solving strategies to generate possible solutions.</td>
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<tr>
<td>● C1.4: I assess the potential impact of possible solutions to select the most viable option</td>
</tr>
<tr>
<td>● C1.5: I defend decisions that reflect responsible citizenship</td>
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<table>
<thead>
<tr>
<th>G: Apply Multiple Literacies- Reading, writing, technology, mathematics, language, media, and personal finance</th>
</tr>
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<tbody>
<tr>
<td><strong>G1: Attain broader and deeper understandings through multiple literacies</strong></td>
</tr>
<tr>
<td>● G1.1: I recognize that there are multiple literacies through which to gain or convey understandings of the world.</td>
</tr>
<tr>
<td>● G1.2: I compare or confirm information attained through multiple literacies.</td>
</tr>
<tr>
<td>● G1.3 I employ multiple literacies to create or share new understandings.</td>
</tr>
<tr>
<td>● G1.4: I evaluate or justify the suitability of specific literacies to leverage information purposefully.</td>
</tr>
<tr>
<td>● G1.5: I integrate multiple literacies to become confident in my ability to inform beliefs, actions, or decisions.</td>
</tr>
<tr>
<td><strong>G2. Engage in multiple literacies through tools and resources used to store, create, or deliver information</strong></td>
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<tr>
<td>● G2.1: I am aware of existing or emerging tools or resources.</td>
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<tr>
<td>● G2.2: I explore the capabilities of various tools, resources, or design.</td>
</tr>
<tr>
<td>● G2.3: I innovate with tools, research, or design to reach new understandings.</td>
</tr>
<tr>
<td>● G2.4: I evaluate how choice of tools, resources, or design may create different understandings from the same information.</td>
</tr>
<tr>
<td>● G2.5: I confidently manipulate tools, resources, or designs to create new understandings in multiple</td>
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</table>
| **Knowledge:**
What knowledge will students acquire as a result of this unit? | **Skills:**
What should students be able to do? What behaviors will they exhibit?

- Students will know reasons why trees and forests are valuable.
- Students will know the kinds of plants and animals that live within forests.
- Students will know the role of trees in the nutrient cycles and in the production of oxygen.
- Students will know the general characteristics that distinguish trees from other plants.
- Students will know the definition of deciduous and coniferous trees.
- Students will know at least four types of trees that are found in the local environment (two deciduous and two coniferous).
- Students will know the growth pattern of a young tree.
- Students will know the human uses of forests.
- Students will know the modern and historical patterns of human use of forests.
- Students will know the human actions that enhance or threaten the existence of forests.

- Students will be able to identify reasons of why trees and forests are valuable to our world.
- Students will be able to understand how trees affect and are affected by the kinds of plants and animals that live within forests.
- Students will be able to understand and express the role that trees have in the nutrient cycles and in the production of oxygen.
- Students will be able to differentiate between trees and other plants.
- Students will be able to differentiate between deciduous and coniferous trees.
- Students will be able to identify at least four types of trees that are found in the local environment.
- Students will be able to identify leaf shapes, leaf arrangements, branching patterns and the overall form of a tree.
- Students will be able to interpret the growth pattern of a young tree.
- Students will be able to identify human uses of forests, and compare modern and historical patterns of use.
- Students will be able to identify human actions that enhance or threaten the existence of forests.
- Students will be able to identify an issue regarding forest use, identify different perspectives on that issue, and identify actions that might be taken.
### 3 – Assessment Evidence

<table>
<thead>
<tr>
<th>Performance Task:</th>
<th>Students will be asked to create a “pitch” similar to those on <em>Dragon’s Den</em> for improving the forest industry. This will be done in groups, and each group will have to present their idea to the judges in the room. Out of each group the students will elect one person to be a judge. The students will be given time to pick a topic, research it, and decide how to pitch it to the judges. The teacher and the judges will have a checklist of what is required of the pitches and will decide which group has the most convincing pitch.</th>
</tr>
</thead>
<tbody>
<tr>
<td>G – Goal</td>
<td>The goal of this project is for you to develop a pitch that explains how you could better the forest industry. The challenge will be for you to think critically on the topic of deforestation. You should use critical thinking, research skills, and presentation skills to complete this project.</td>
</tr>
<tr>
<td>R – Role</td>
<td>You have been asked to take on the role of researchers to find information on how we can better the forestry industry. You have been asked to take on the role of presenters as you pitch your ideas to the panel of judges. And lastly, you have been asked to take on the role of judges and analyze the pitches from all the groups to decide which one was presented the most proficiently with the most valid information.</td>
</tr>
<tr>
<td>A – Audience</td>
<td>You need to approach this as the forest is your client that you are working for. You want to find ways to rally for the forest to decrease the amount of damage being done to it. You will be presenting this to the class but also the judges and teacher. Any other teachers or administration that are interested in being judges may also be present.</td>
</tr>
<tr>
<td>S – Situation</td>
<td>You will be presenting a pitch. This means you need to be well prepared, you need to complete the research required to have a solid understanding of your topic, and you need to present in a confident manner that is convincing to the judges.</td>
</tr>
<tr>
<td>P – Product, Performance</td>
<td>You will create a pitch for your topic. This may include a poster or presentation, either electronic or not, to help represent your information and view on the topic. You will present this pitch as your way to help with slowing deforestation. Each group member will have an equal share in the work and presentation of your pitch.</td>
</tr>
<tr>
<td>S – Success</td>
<td>You will be presenting your pitch to the panel of judges. Each judge will have a checklist of requirements and will</td>
</tr>
<tr>
<td>Day #</td>
<td>Learning Outcome (Curriculum)</td>
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<td>-------</td>
<td>--------------------------------------------------------------------------------------------</td>
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</tbody>
</table>
| 1     | 1. Identify reasons why trees and forests are valued. Students meeting this expectation should be aware that forests serve as habitat for a variety of living things and are important to human needs for recreation, for raw materials and for a life-supporting environment. | **Introduction to a Forest:**  
In groups, give students a large chart paper. Have them write “Trees and Forests” in the center of their paper. Students will be making a web of reasons as to what a forest is and how trees and forests are important. This web can be as creative as they like - suggest a graffiti theme.  
Importance of trees would include the following:  
- provide us with useful products  
- produce oxygen  
- control erosion  
- enrich the soil  
- provide food, homes and shelter for wildlife  
- protect us from the sun’s heat and from strong, cold winds  
- act as sound barriers  
- add beauty and enjoyment to lives  
Have students do a walk-around to observe everyone else’s chart or “graffiti”. Class discussion regarding common themes and ideas. | FOR: students will observe the chart paper from other groups and make note of ideas that other people made  
FOR: check for understanding with class discussion regarding common themes | -pencils  
-markers  
-large chart paper |
| 2     | 1. Identify reasons why trees and forests are valued. Students meeting | **Levels of the Forest:**  
Give each student a piece of paper that is divided into 4 sections. |                                                                                       | -Levels of the Forest Interactive Game: |
this expectation should be aware that forests serve as habitat for a variety of living things and are important to human needs for recreation, for raw materials and for a life-supporting environment.

2. Describe kinds of plants and animals found living on, under and among trees; and identify how trees affect and are affected by those living things.

<table>
<thead>
<tr>
<th></th>
<th>Upper Canopy</th>
<th>Middle Level or Understory</th>
<th>Herb, Underbrush, or Shrubbery Layer</th>
<th>Forest Floor</th>
</tr>
</thead>
<tbody>
<tr>
<td>They will label each of the sections, starting with the top:</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Watch video to help students broaden their understanding and give them a visual of the levels of a forest:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><a href="http://nationalzoo.si.edu/education/conservationcentral/walk/walk2.html">http://nationalzoo.si.edu/education/conservationcentral/walk/walk2.html</a></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within each section, students can color, draw and/or list different features of that level and the different plants and animals that occupy that level. Students can fill in these levels any way they like (it is how they learn best) as long as the information is there.</td>
<td></td>
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</tbody>
</table>

3. Describe kinds of plants and animals found living on, under and among trees; and identify how trees affect and are affected by those living things.

| Living vs. Non-living: |
| As a group, have the students list all of the components of a forest ecosystem. Have two students come up to write the answers on the board for the group. Split the students into groups and have each group classify the components as living or non-living in the form of a t-chart. Talk about the relationship between the living and non-living components. Would the living components be able to survive without the non-living components? Introduce the vocabulary: producers, consumers, decomposers |
| FOR: students will be assessed for understanding by handing in their t-charts |
| -SmartBoard |
| -Chart paper- 1 for each group |
| -Markers |
| 4 | 2. Describe kinds of plants and animals found living on, under and among trees; and identify how trees affect and are affected by those living things. | **Food Chains:**
What are some food chains that exist in the ecosystem?
Each student will be creating two “chains” using three strips of paper for each chain (each student needs a total of 6 strips of paper). Begin the chain with a producer, then a consumer that might eat a producer, and then followed by other consumers to finish up the chain (decomposers are left out of the chain because technically, the chain ends with the top carnivore). The strips of paper need to be linked together like a chain.

Examples:
- acorn bush → squirrel → owl
- poplar tree → caterpillar → robin

Once the chains are finished, have students walk around the room to see if they can connect with anyone else's chain.
As a class, discuss how producers, consumers, and decomposers are dependent on the non-living components of water, soil, and on each other. | FOR: the creation and linking of chains will be a demonstration of student knowledge about food chains
FOR: class discussion will allow teacher to check for understanding

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| 5 | 2. Describe kinds of plants and animals found living on, under and among trees; and identify how trees affect and are affected by those living things. | **We’re All Connected:**
Prior to activity, prepare name tags by writing living or non-living components on each one. Make one that says “sun” and keep that as the teacher’s tag. Everyone gets a name tag and sits around a circle. The teacher has the ball of string, hangs on to the end of the string and tosses the ball to one of the students saying, “I am the sun and I provide energy for the acorn bush to grow”. That student continues by saying, “I am the acorn bush and I provide energy to the squirrel” and toss it to the squirrel. Continue this until everyone is connected. | FOR: check for understanding throughout the activity by observing student participation
How the Sahara feeds the Rainforests, start at 1:53 (approximately 2 minute long video)
Index cards, string, masking tape |
3. Describe the role of trees in nutrient cycles and in the production of oxygen.

### Nutrient Cycle:

Show students a picture of the nutrient cycle:

![Nutrient Cycle Diagram](http://www.biorecycle.com/nutrient_cycle.shtm)

Students will have a blank copy of the nutrient cycle to fill in as it is discussed and presented in class. Handout found in:


Show students a video about the nutrient cycle:

[http://www.youtube.com/watch?v=A98S-BqP4Po](http://www.youtube.com/watch?v=A98S-BqP4Po)

This gives students a visual for the nutrient cycle and a video to bring the concept to life.

End the class by playing Nutrient Tag!

**Instructions:**
- Divide students into three groups - decomposers, consumers, producers
- Play Nutrient Tag using balls, pinnies, and a nutrient cycle handout

**FOR:** students filling out the handout on the nutrient cycle will demonstrate their understanding of the nutrient cycle.

**FOR:** by seeing students play the nutrient tag, their understanding of producers, consumers, and decomposers is demonstrated.

- The Nutrient Cycle Picture
- Pencil
- Blank nutrient cycle handout
- Nutrient Cycle Video
  - [http://www.youtube.com/watch?v=A98S-BqP4Po](http://www.youtube.com/watch?v=A98S-BqP4Po)
- Balls
- Pinnies
- SmartBoard
(twice as many as decomposers), and producers (twice as many as consumers). Example: For a class of 27, you will have 3 decomposers, 6 consumers, and 18 producers.

- Use pinnies to identify each group.
- There needs to be a pile of balls in the center of the room - only producers are allowed to pick up a ball.
- Consumers can only take a ball from producers and decomposers can only take a ball from consumers.

Closing: remind students of field trip to Bower Ponds and to dress appropriately.

1. Identify reasons why trees and forests are valued. Students meeting this expectation should be aware that forests serve as habitat for a variety of living things and are important to human needs for recreation, for raw materials and for a life-supporting environment.

2. Describe kinds of plants and animals found living on, under and among trees; and identify how trees affect and are affected by those living things.

**Nature Walk - Bower Ponds: Photography scavenger hunt**

Upon arriving at Bower Ponds, split the students up into even groups based on the number of supervisors available. Give each group a copy of the scavenger hunt.

The scavenger hunt will ask the students to take pictures of specific items with as many group members in the photos as possible.

One point will be awarded for each group member in the picture. Five points will be given for having the required item in the picture.

The scavenger hunt items are:
- pictures to represent each level of the forest
  - Upper Canopy
  - Middle Level or Understory
  - Herb, Underbrush, or Shrubbery Layer
  - Forest Floor
- pictures of 3 producers, 3 consumers and 3 decomposers
- 5 pictures representing evidence of the nutrient cycle
- at least 2 pictures of people using the area for recreation

The pictures will be reviewed by the teacher and points will be awarded. The winning group could receive a small prize (ie. stickers or pencils).

Once the class returns to the classroom, the students will share their
| 8 | 3. Describe the role of trees in nutrient cycles and in the production of oxygen. | **The Leaf - Our Oxygen Factory:**
Present the idea of photosynthesis to the students.
Show students this video at the beginning of class: http://youtu.be/C1_uez5WX1o

Students will have a blank copy of the leaf as an oxygen factory to fill in as it is discussed and presented in class. Handout found in: Manson, L., et al. (1996). *Topic e trees and forests*. Consulting Services, Edmonton Public Schools.

| FOR: students filling out the handout on photosynthesis will demonstrate their understanding of the nutrient cycle
FOR: exit pass on two things that the students felt they learnt well in this lesson - checking for understanding | -pencil
-Photosynthesis Song Video http://youtu.be/C1_uez5WX1o
-SmartBoard |
|---|---|---|
| **Photosynthesis Equation** | **Carbon dioxide** + **Water** (SUNLIGHT) **Sugar** + **Oxygen**

6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2

“Photo” refers to the light which is required and “synthesis” means “to make”.

Wrap up the lesson by showing students a video on the process of photosynthesis and cool facts about plant cells on this site: http://www.biology4kids.com/files/plants_photosynthesis.html

Have students write an exit pass stating two things that they feel they learnt well in this lesson. | |
| 9 | 3. Describe the role of trees in nutrient cycles and in the production of oxygen. | **Trees and The Water Cycle:**

**Before school starts (2-3 hours prior to class time):** attached clear plastic baggies to a variety of coniferous and deciduous trees around

| FOR: labeling the water cycle serves as a review
FOR: observations | -clear baggies
-sharpie to label baggies
-twist ties |
| 15 | their leaves. Attach using twist ties. Make sure the baggies are labelled with the type of tree it is tied to for later use. Do this in an area of the school yard that most likely will not be disturbed by anyone. Take pictures of the baggies around the leaves.

**During class:** Ask the class "Do the leaves of the tree give off moisture?". Ask students to discuss with their table groups.

Show the students the pictures of the baggies you tied around the leaves, ask them if any moisture is present in the bags. Make predictions if there will be moisture in the baggies. How much? In all the baggies, or only select baggies?

Take the students outside to where the baggies are and ask the students to make observations. The baggies should have moisture in them so ask the students to remove them with care. Measure the amount of moisture in each bag by pouring it into a graduated cylinder. Ask students to record the findings in their notebooks.

Upon returning to the classroom, review the water cycle. Have the students label the water cycle handout found in:

| 10 | 4. Identify general characteristics that distinguish trees from other plants, and characteristics that distinguish deciduous from coniferous trees. | recorded serve as evidence of learning -water cycle handouts |

| 10 | 4. Identify general characteristics that distinguish trees from other plants, and characteristics that distinguish deciduous from coniferous trees. | recorded serve as evidence of learning -water cycle handouts |

| 10 | What is a Tree? | for: check notebooks to see that a 1-chart is drawn and the tree parts are labeled -parts of a tree handout -notebooks -pencils |

- What is a Tree?

Ask the students to discuss with their shoulder partner: "What is a tree?" Have a group discussion and ask students to share their answers.

Then, ask students to create a t-chart in their notebooks to compare the characteristics of a tree and a plant. (ex. trees are perennial, plants are perennial, annual or biennial)

Have the students write the definition of a tree, it must include:
- perennial
- self supporting trunk
- trunk is made of woody material

Teach the parts of a tree and have students label the parts as they learn them on the handout found in: Manson, L, et al. (1996). *Topic e trees and forests*. Consulting Services, Edmonton Public Schools.

**Parts of a tree:**

- roots
- trunk
- outer bark (cork)
- branch
- needles or leaves
- cones
- crown
- xylem
- phloem
- cambium
- heartwood
- sapwood

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**4. Identify general characteristics that distinguish trees from other plants, and characteristics that distinguish deciduous from coniferous trees.**

<table>
<thead>
<tr>
<th>Deciduous vs. Coniferous:</th>
<th></th>
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<tbody>
<tr>
<td><strong>Characteristics of trees (vocabulary):</strong></td>
<td></td>
</tr>
<tr>
<td>- Students (in groups or desk pods) will jot down on post-it notes various characteristics or names of trees and stick them to chart paper (no specific order or placement needed). Take a few minutes to allow the groups to share their findings.</td>
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</tr>
<tr>
<td>- Class discussion - characteristics that make trees unique and different from other plants (make t-chart on board)</td>
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<tr>
<td>- Introduce coniferous/deciduous trees and the differences between their characteristics - show pictures distinguishing the two</td>
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<tr>
<td>- YouTube Video - coniferous and deciduous (alike and different)</td>
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<tr>
<td>- Returning to groups from start of class, students draw Venn diagram on the chart paper, and place their post-it notes in the appropriate circles</td>
<td></td>
</tr>
</tbody>
</table>

**FOR: CFU- on the way out the door students have to give teacher a high-five and a characteristic of either a deciduous or coniferous tree**

**-Video:** Coniferous and Deciduous [https://www.youtube.com/watch?v=-lc3vLCKdmg](https://www.youtube.com/watch?v=-lc3vLCKdmg)

**-SmartBoard**

**-chart paper**

**-sharpies**

**-Post-It notes**
- Students will wander around the room to see Venn diagrams
- Closing - ask students if they noticed anything different from other groups than what their own group had, or if they disagree with where a characteristic was placed
- Remind students to wear green the next day in support of National Tree Day

<p>| | |</p>
<table>
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</table>
| 12 | 9. Identify human actions that enhance or threaten the existence of forests.  
10. Identify an issue regarding forest use, identify different perspectives on that issue, and identify actions that might be taken. |
|   | September 24 - National Tree Day:  
*Students can wear green in support of National Tree Day*  
Bruce Cockburn (Canadian writer, activist, and musician) - If a Tree Falls  
Students watch first video (original song/video), and on a graphic organizer will write down key ideas, themes, or concepts they hear or see during the song, and then a general class discussion about what they saw/heard  
Students will watch second video (live/acoustic version of song with lyrics shown) and will write down any new ideas or themes, or words they don’t know/understand  
Class discussion, slide-by-slide, to clarify unknown vocabulary and themes  
Possible discussion questions: What is Bruce Cockburn’s message? What is he trying to say? What is his perspective? Do you agree/disagree? How does this song/video make you feel? What can be done about this issue?  
Closing - at bottom of graphic organizer, students must write a statement on one key impression the song/video made on them |
|   | FOR:  
CFU/participation- students will hand in graphic organizer  
-Video 1: If a Tree Falls (original): http://youtu.be/ErS9HCh8GfE?list=RDErS9HCh8GfE  
-Video 2: If a Tree Falls (live/acoustic): http://youtu.be/13KUZ53NWq0?list=RD13KUZ53NWq0  
-T-chart graphic organizer |
| 13 | 6. Describe and classify leaf shapes, leaf arrangements, branching patterns and the overall form of a tree. | **Branching Patterns and Tree Shapes:**  
Class discussion - what are branches? Why are they important?  
Discuss form and function.  
Show pictures on SmartBoard of examples of the different shapes of trees:  
- Triangle or cone  
- Oval  
- Circle  
- Spreading  
- Rectangle  
Direct instruction and class discussion regarding the shapes.  
On a graphic organizer, students will write down characteristics of each tree shape next to the corresponding picture.  
Bring in samples of pruned tree branches from several different types of trees.  
Students will explore the characteristics of branching patterns on the branch samples:  
- Location of first branches  
- Compass direction the branches grow from the trunk  
- Length of branches  
- Prevailing wind direction  
Class discussion surrounding the life of a tree and how the branches give us information about how and where the tree has grown. | FOR: Students will hand in graphic organizer (CFU) - SmartBoard - pruned tree branch samples - tree shape pictures - graphic organizer |
| 14 | 6. Describe and classify leaf shapes, leaf arrangements, branching patterns and the overall form of a tree. | **Leaf Classification:**  
Types of leaves:  
- Simple leaves  
- Compound leaves  
- Double compound leaves  
- Bundle of 2 needles  
- Bundle of 5 needles  
- Single needles  
- Scaly needles | FOR: Students will use Fist of Five or Red Light, Green Light to show their understanding  
<table>
<thead>
<tr>
<th>Variations in leaves:</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Type: simple, compound, or needle</td>
</tr>
<tr>
<td>● Arrangement on branch: alternative, opposite, whorled, in bundles, or groups of a specific number</td>
</tr>
<tr>
<td>● Margins: smooth, wavy, or scalloped, fine-toothed, coarse-toothed, or serrated</td>
</tr>
<tr>
<td>● Shape</td>
</tr>
</tbody>
</table>

As many real examples of these leaves should be collected and used to show the students the differences in characteristics. For any leaves that cannot be found images can be used to give them the visual.

<table>
<thead>
<tr>
<th>15</th>
<th>5. Identify characteristics of at least four trees found in the local environment. Students should be familiar with at least two deciduous trees and two coniferous trees.</th>
<th>Characteristics of Four Tree Species:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intro: review with class the characteristics of coniferous and deciduous trees</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Show images of local tree species and discuss distinguishing characteristics (ex: spruce, birch, poplar, pine).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Using computers, students will research specific local tree species (two coniferous and two deciduous) and fill out the information sheet, including bark color/texture/pattern, branch pattern, leaf arrangement/shape, and fruit/flowers/cones. They must reference where they find their information from. Students must also include a drawing/sketch of their tree.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Closing: remind students that they will be going outside next class for a nature walk so dress appropriately</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FOR: students will hand in their information sheet</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-laptops or computer lab</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Four local species information handout</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>16</th>
<th>5. Identify characteristics of at least four trees found in the local environment. Students should be familiar with at least two deciduous trees and two coniferous trees.</th>
<th>Tree Bark:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The class will be heading outside on a “Nature Walk” to look at 2 deciduous and 2 coniferous trees. The students will be examining the characteristics of the different trees’ bark, branch growth, and leaves/needles.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FOR: Students will be assessed based on their ability to recognize the different leaf and bark types of the tree.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-8 pieces of white paper per two students</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Each student needs a pencil</td>
<td></td>
</tr>
</tbody>
</table>
| 17 | 1. Identify reasons why trees and forests are valued. Students meeting this expectation should be aware that forests serve as habitat for a variety of living things and are important to human needs for recreation, for raw materials and for a life-supporting environment.  
2. Describe kinds of plants and animals found living on, under and among trees; and identify how trees affect and are affected by those living things.  
9. Identify human actions that enhance or threaten the existence of forests.  
10. Identify an issue regarding forest use, identify different perspectives on that issue, and identify actions that might be taken. | **Guest speaker: Medicine River Wildlife Centre**  
Prior to guest speakers arriving, it would be important to discuss with them that the focus of their presentation should be centered around the trees and forest unit and how the wildlife centre connects to the forest. It would be useful to share with them the specific outcomes so they understand the purpose of having a guest speaker.  
Through a powerpoint presentation, the speakers will introduce the students to the concept of wildlife rehabilitation showing the hospital procedures and what people can do when finding injured wildlife. They will give an overview of the species they treat and the injuries they see. Next, a discussion on how humans impact wildlife and actually create the hazards, causing the injuries. The speakers will then discuss the impact of humans on the forest environment and how it impacts animals that live there, as well as what humans can do to protect the forests and minimize the harming of animals. The speakers attempt to leave students with the feeling that they have the power to make a difference.  
Students will have an opportunity to ask questions and engage in discussion with presenters.  
Closing: exit pass | FOR: exit pass- students will write down two interesting facts or two things they learned from the guest speakers  
Medicine River Wildlife Centre website: http://www.medicineriverwildlifecentre.ca/education/classroom |
| 18 | 7. Interpret the growth pattern of a young tree, distinguishing this year’s growth from that of the previous year and from the | **Life of a Tree:**  
Begin the lesson by showing the class the growing tree video: http://www.youtube.com/watch?v=RjnkAWxCK5k | FOR: students will be assessed based on their ability to distinguish different conditions that have | -pencils  
-paper  
-Smart Board  
-Growing Tree Video: |
Students meeting this expectation should recognize differences in colouration and texture of new growth and old growth, and locate scars that separate old and new growth.

Have a short discussion with the class about what they saw and ask them how old they think trees get.

Show the class the Tree Cookie Website, it goes over different conditions which affect trees [http://www.wonderville.ca/asset/tree-cookies](http://www.wonderville.ca/asset/tree-cookies)

Ask the students to start a chart in their notebooks to record findings:

<table>
<thead>
<tr>
<th>Observations</th>
<th>Inferences (Possible Reasons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>rings are close together</td>
<td>a drought might have occurred, not much growth that season</td>
</tr>
<tr>
<td>...etc.</td>
<td></td>
</tr>
</tbody>
</table>

Using pictures of tree cookies on the Smart Board ask students to identify:
- how many rings there are
- variations in the rings
- any of the conditions from the tree cookies website

Record additional findings into the above chart.

http://www.youtube.com/watch?v=RjnKAWxCk3k

- Tree Cookie Website: [http://www.wonderville.ca/asset/tree-cookies](http://www.wonderville.ca/asset/tree-cookies)

- Tree Cookie Images: [http://c3e308.medialib.glogster.com/media/4f/4f8e6780df17a1468639d6346eca821f4f988a8de5231386004ceee4b438f2/woodcross2.jpg](http://c3e308.medialib.glogster.com/media/4f/4f8e6780df17a1468639d6346eca821f4f988a8de5231386004ceee4b438f2/woodcross2.jpg)

- http://www.youtube.com/watch?v=RjnKAWxCk3k

- Tree Cookie Website: [http://www.wonderville.ca/asset/tree-cookies](http://www.wonderville.ca/asset/tree-cookies)

- Tree Cookie Images: [http://c3e308.medialib.glogster.com/media/4f/4f8e6780df17a1468639d6346eca821f4f988a8de5231386004ceee4b438f2/woodcross2.jpg](http://c3e308.medialib.glogster.com/media/4f/4f8e6780df17a1468639d6346eca821f4f988a8de5231386004ceee4b438f2/woodcross2.jpg)
| 19 | 7. Interpret the growth pattern of a young tree, distinguishing this year’s growth from that of the previous year and from the year before that. Students meeting this expectation should recognize differences in colouration and texture of new growth and old growth, and locate scars that separate old and new growth. | **Tree Story:**

Explain that
- the dark ring is the summerwood
- the lighter colored ring is the springwood
- the space in between is the growth from that year and is called the “annual ring”
- little to no growth in winter

Activity: In the same way that humans have fingerprints, a name, and a story, so do trees.

Students will be given a tree cookie and a worksheet. In partners or individually, students will come up with a name and a story for their cookie using the concepts used earlier in the lesson.

-If time allows, students will share their tree names and story to the rest of the class

Reiterate on the connection between humans and trees at the end of the lesson

Collect exit pass | FOR: exit pass asking what the dark ring is called, what the lighter colored ring is called and what the “annual ring” is |

| 20 | 8. Identify human uses of forests, and compare modern and historical patterns of use. | **Human Use of the Forest - Past, Present, and Future:**
(Part One)

Within this lesson and the next, students will create a class bar graph to examine how human use of the forest has changed. | FOR: the bar graph charts that students create for past, present and future show their |
Focus on the question: *How do humans use the forest?*

Give each student sticky notes. The teacher sets up three pieces of chart paper around the classroom that look like this:

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Survival</strong></td>
<td><strong>Recreation</strong></td>
<td><strong>Jobs</strong></td>
<td><strong>Resource Use</strong></td>
</tr>
</tbody>
</table>

One chart needs to be created for PAST, PRESENT and FUTURE. The sticky notes posted on the chart will form a bar graph for each category of forest use. Encourage each student to post at least one sticky note to each chart paper and to not duplicate the answers of others.

Before letting students participate in this activity, the teacher should facilitate a discussion centered around each graph (PAST, PRESENT and FUTURE).

**PAST - focus on Native American uses of the forest**
- Medicine *(brewed tea, mountain ash berries used to treat scurvy, gummy sap to cure toothache, etc.)*
- Foods *(berries, fruits, nuts, sugar, syrup, etc.)*
- Homes *(teepee poles, logs for cabin, furniture, fences, wood for fuel, etc.)*
- Transportation *(wagons, canoes, boats, snowshoes, etc.)*
- Tools *(handles, arrows, bows, hammers, etc.)*
- Leisure *(toys, totem poles, jewelry, games, etc.)*
- Fuel *(firewood)*

- SmartBoard
  Rick Mercer Heli Logging (6:51)
  http://www.youtube.com/watch?v=Uhb7XHUypJo
Human Use of the Forest - Past, Present, and Future: (Part Two)

Start off the class with a video on how paper is made:
http://youtu.be/fZ3HQ9IBHuA

Now that they have seen how paper is made in a factory, it is time for them to make it in class!

FOR: students making paper will demonstrate their understanding of a modern use of a forest, it will also make it relevant to

-How Paper is Made (1:36 minute long video)
http://youtu.be/fZ3HQ9IBHuA
How to Make Paper video
What is needed to make paper:
- used paper
- mold and deckle apparatus (simple to make - wood frame holding screen)
- blender
- large container to set mold and deckle in
- anything decorative you want in your paper - glitter, color, etc.
- sponge
- paper towel
- iron - to make paper faster, but it is optional
- felt and weights to make it flat

Steps on video: [http://www.youtube.com/watch?v=fyr24PgpDDs](http://www.youtube.com/watch?v=fyr24PgpDDs)
(starting at 2:58 minutes and ending at 7:50 minutes)

Read students 'Last Tree in the City':

If there is time, the class could also watch the last 20 minutes of 'The Lorax' movie:
[https://www.plt.org/stuff/contentmgr/files/1/7d107c9eef935991a82355f8b8f2640/files/plt_lorax_activities.pdf](https://www.plt.org/stuff/contentmgr/files/1/7d107c9eef935991a82355f8b8f2640/files/plt_lorax_activities.pdf)

1. Identify reasons why trees and forests are valued. Students meeting this expectation should be aware that forests serve as habitat for a variety of living things and are important to human needs for recreation, for raw materials and for a life-supporting environment.

**The Forest in My Home:**

Have students work in small groups to brainstorm all the items in their households that are made of wood from trees. Once the students have a list of at least 20 items have them draw the items on a poster.

The students will have an opportunity to share their posters with the rest of the class and explain what they have drawn.

After all the groups have shared their poster, have a discussion with the class on the items that they chose. Are you surprised with how many items are made trees? How does this affect our forests? Is it better to them since they actually get to make paper

[http://www.youtube.com/watch?v=fyr24PgpDDs](http://www.youtube.com/watch?v=fyr24PgpDDs)

- other materials in lesson plan
- Book
- Movie
[https://www.plt.org/stuff/contentmgr/files/1/7d107c9eef935991a82355f8b8f2640/files/plt_lorax_activities.pdf](https://www.plt.org/stuff/contentmgr/files/1/7d107c9eef935991a82355f8b8f2640/files/plt_lorax_activities.pdf)

FOR: Student will be assessed on the completion of their posters
- Poster paper- 1 per group
- Each group will need coloring pencils or markers
8. Identify human uses of forests, and compare modern and historical patterns of use.

use items made of plastic or other material or wood?

---

| 23 | 9. Identify human actions that enhance or threaten the existence of forests. | **Enhance vs. Threaten:**

Give each student a "human action" that affects the forest; either by enhancing it or threatening it. Have the students use the computers to research their "human action" and come up with evidence on whether it enhances our forests or threatens them.

Provide the students with a google document that allows all of them to add their information. They will be working with the guidelines of: name of the action, does it enhance or threaten the forest, and what evidence did you find to support your conclusion.

At the end of the lesson the students should have a whole document to see what human actions have what kind of a effect on our forests. |

| 24 | 9. Identify human actions that enhance or threaten the existence of forests. | **Positive and Negative Effects of Nature and Humans:**

Have students work in small groups for this activity, no more than four students to a group.

Each group will have two sheets of wide chart paper.

The first chart will be titled NATURAL THREATS TO THE FOREST.

<table>
<thead>
<tr>
<th>Natural Threats</th>
<th>Positive Effects</th>
<th>Negative Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>snow and ice</td>
<td>- supplies water</td>
<td>- breaks branches</td>
</tr>
<tr>
<td></td>
<td>- distributes seeds</td>
<td>- erodes soil</td>
</tr>
</tbody>
</table>

insects

FOR: Students will be assessed on their contribution to the google doc for understanding

FOR: students create charts to show how nature and humans have both positive and negative effects on forests

-2 pieces of chart paper for each group of 4 students

-markers
wind

flowing water

The second chart will be titled HUMAN THREATS TO THE FOREST.

<table>
<thead>
<tr>
<th>Human Threats</th>
<th>Positive Effects</th>
<th>Negative Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>chemicals (pesticides,</td>
<td>- controls or kills</td>
<td>- changes ecosystem</td>
</tr>
<tr>
<td>herbicides, insecticides,</td>
<td>disease</td>
<td>toxic</td>
</tr>
<tr>
<td>etc.)</td>
<td>- increases crop yield</td>
<td></td>
</tr>
<tr>
<td>logging</td>
<td></td>
<td></td>
</tr>
<tr>
<td>recreation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>industry</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Students can create these categories and more…*

Near the end of the lesson, have students do a walk-through the classroom and see what other groups used as categories and examples on their charts.

10. Identify an issue regarding forest use, identify different perspectives on that issue, and identify actions that might be taken.

**Issues, Issues, Issues:**

Mountain Pine Beetle (MPB) - class discussion - What is it? Where does it live? What does it do? Why is it a problem? What can be done? Show on SmartBoard pictures of pine beetles, the destruction they cause, maps of Alberta and surrounding regions affected.

What is Alberta’s strategy for dealing with MPB? In partners, students will research methods for dealing with Mountain Pine Beetle. They will be assigned the roles of recorder and researcher. They will write a half-page paragraph on what strategy they feel is best and why,

FOR: students will be assessed based on their assigned roles, contributions to the paragraph, and their presentation

-Mountain Pine Beetle in Alberta website: http://mpb.alberta.ca/
including pros and cons of the strategy. They will present this to the class. Each partner must present facts and reasoning behind their choice.

Closing - after hearing all presentations, class will vote on which is the best strategy for dealing with pine beetle.

Remind students of field trip to Nordegg tomorrow and make sure to dress appropriately.

### 26 All Unit Outcomes

**Field Trip - Des Crossley:**

The curriculum-based, full-day program will expose students to the multiple values of a working forest. Des Crossley is located 25 km southwest of Rocky Mountain House. Historically a research site, the demonstration forest is a quarter-section of forested land with a 2.5km maintained trail system. Field trip themes covered include:

- Forest ecosystems
- Natural resource development
- Tree and shrub identification
- Tree measurements
- Land use and multiple perspectives
- Careers
- Trees and their products
- Stewardship

Students will be required to fill out information learned based on the tour guide’s instructions. At the end of the day, students will be asked to reflect and write on what they’ve learned.

**FOR:** students will hand in booklet and reflection

- Des Crossley Demonstration Forest: http://www.insideeducation.ca/DesCrossley
- Pencils
- Field trip booklet

### 27

10. Identify an issue regarding forest use, identify different perspectives on that issue, and identify actions that might be taken.

**Take Action:**

Have students get in the role of making a difference! Students will choose an organization or business to write a letter to regarding issues of deforestation and forest conservation. The letter will be written in business letter format and will include:

- reason for writing, the issue, why it is an issue, what the student sees

**Forest Resources Directory:** 101 Alberta Block, 10526 Jasper Avenue, Edmonton, Alberta, T5J 1Z7
as a plausible solution, request a response to the letter from the company.

| 28 | 1. Identify reasons why trees and forests are valued. Students meeting this expectation should be aware that forests serve as habitat for a variety of living things and are important to human needs for recreation, for raw materials and for a life-supporting environment. |

| 28 | **Preparation for Venture Capital Project:** The goal of this project is for student’s to develop a pitch that explains how they think they could better the forest industry. Some examples are: better ways to do reforestation, how to create more jobs in the forest industry, ways to better utilize all parts of a logged tree and more efficient ways of logging.  

| 28 | Show the Dragons’ Den video to begin the class to give the students an idea of what a pitch looks like and the way the judges might interact with them. [http://youtu.be/1XGSEfL6ZSU](http://youtu.be/1XGSEfL6ZSU)  

| 28 | Have students work in small groups of 4-5. Each student must contribute equally to the final project. This will be achieved through the use of a checklist each student must complete. The grading for this project will be 30% individual (checklist) and 70% group work (rubric). See rubric and checklist attached to ‘Lesson 3’.  

| 28 | Today’s class will be used to brainstorm ideas for pitches. The teacher can then assign groups, and each group can decide on a pitch topic. Each pitch idea should only be used once. The rest of the class time can be used for groups to split up their topic and begin the research process.  

| 28 | During this lesson, each group must also appoint one of their group members as a ‘judge’. This group member will participate in their own group’s pitch presentation and will act as a judge during all other group presentations. The teacher will also act as a judge. Judges will be given a checklist to follow to determine if the presenting group has fulfilled all the required components. See judge checklist attached to ‘Lesson 3’.  

| 29 | See Lesson #28  

| 29 | **Preparation for Venture Capital Project:**  

| FOR: Rubric and Checklist for Venture Capital Project |  

<p>| Dragon’s Den Video: start at 8:35, end at 14:35. <a href="http://youtu.be/1XGSEfL6ZSU">http://youtu.be/1XGSEfL6ZSU</a> |</p>
<table>
<thead>
<tr>
<th>Lesson</th>
<th>Activity</th>
<th>Description</th>
<th>Materials</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>Venture Capital Project: Presentations Today</td>
<td>Students will be given 7-10 minutes to present their pitch to the judges. Following this time, the judges will be given up to 5 minutes to ask the group questions about their presentation.</td>
<td>OF: Rubric and Checklist for Venture Capital Project</td>
<td>-SmartBoard</td>
</tr>
<tr>
<td>31</td>
<td>Venture Capital Project: Presentations Today</td>
<td>The remainder of the presentations will be presented today. Following presentation, if time permits, the teacher will debrief about the presentations.</td>
<td>OF: Rubric and Checklist for Venture Capital Project</td>
<td>-SmartBoard</td>
</tr>
<tr>
<td>32</td>
<td>Review for Unit Test:</td>
<td>Students will use this class to review for their “traditional” unit test. They can take this opportunity to ask the teacher any questions in preparation for the test.</td>
<td>FOR: review all unit content for unit test</td>
<td>-course notes/content</td>
</tr>
<tr>
<td>33</td>
<td>Review for Unit Test:</td>
<td>Students will use this class to review for their “traditional” unit test. They can take this opportunity to ask the teacher any questions in preparation for the test.</td>
<td>FOR: review all unit content for unit test</td>
<td>-course notes/content</td>
</tr>
<tr>
<td>34</td>
<td>Unit Test:</td>
<td>During this class time, students will be writing their “traditional” unit test. Before the test begins, the teacher should ask if there are any final questions before they get started. The teacher should also specify their expectations of the students for the test (no talking, no cheating)</td>
<td>OF: traditional unit test</td>
<td>-Unit Test -pencils</td>
</tr>
<tr>
<td>35</td>
<td>Go Over Unit Test:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----</td>
<td>------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Review unit test answers with students. Discuss any questions that they have about the test.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wrap up the class and unit by watching a segment of 'The Lord of the Ring: The Two Towers’ where the hobbits meet Tree Beard, the Ent. This gives a great animation to trees and forests.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FOR: review unit test answers with students
- marked unit tests
- 'The Lord of the Rings: The Two Towers’ movie
### Appendix - Resources

*What resources could you potentially use to enhance the unit and broaden the student experience and understanding about your topic? Consider audio, visual, technology, literature and community. Use APA formatting for your resources.*

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Technology</strong> websites, webquests, wikis, interactive games, Web 2.0 tools</td>
<td></td>
</tr>
</tbody>
</table>


Released 2008 Achievement Test: Science Grade 6.
https://education.alberta.ca/media/1153254/02%20science%2006%20released%202009.pdf |

| | Alberta Education. (2014). *Programs of study*. Retrieved from Alberta Education:
https://education.alberta.ca/teachers/program.aspx |