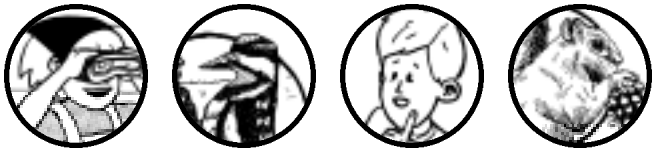


EnviroKids
Investigate Forest Health

Teacher Utilization Guide for Grade 6 & 7 Teachers

Introduction:

Learning about forest ecosystems involves investigating many different perspectives including ecological, industrial, recreational, cultural, and economic values. This Guide gives teachers an easy-to-use outline for incorporating the *EnviroKids Investigate Forest Health* activity book into their classrooms.

The curriculum-connected activities for grade six and seven students included here and in the activity book are designed to bring the topics of forest ecology and forest health into the classroom. They also provide students with an understanding of what the government does to meet the challenges of maintaining healthy forests.

For further information, contact:

Alberta Sustainable Resource Development
Forest Health Section
Forest Management Branch
Public Lands and Forests Division
8th Floor, Great West Life Building
9920-108 Street
Edmonton, Alberta T5K 2M4
fh.info@gov.ab.ca

For additional copies of the EnviroKids activity book, contact:

Alberta Information Centre
Main Floor, 9920-108 Street
Edmonton, Alberta T5K 2M4
Tel: Toll-free 310-0000 (enter 780-944-0313)
Fax: 780-427-4407

Alberta
GOVERNMENT OF ALBERTA

We would like to acknowledge the contributions of Erin Gluck, Steve McIsaac, Christine Kominek, Hideji Ono, Sunil Ranasinghe, Mike Undershultz, and Patrick Loewen.

Published 2004

ISBN No. 0-7785-3556-8 (Printed Edition)
ISBN No. 0-7785-3557-6 (On-line Edition)
Pub No. I/159

Grade 6 Teachers

Curriculum Connections:

Topic E – Trees & Forests

- Identify reasons why trees & forests are valued.
- Describe kinds of plants and animals found living on, under, and among trees.
- Describe the role of trees in nutrient cycles and in the production of oxygen.
- Identify general characteristics that distinguish trees from other plants, and characteristics that distinguish deciduous from coniferous trees.
- Identify characteristics of at least four trees found in the local environment.
- Describe and classify leaf shapes, leaf arrangements, branching patterns and the overall form of a tree.
- 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.
- Identify human uses of forests, and compare modern and historical patterns of use.
- Identify human actions that enhance or threaten the existence of forests.
- Identify an issue regarding forest use, identify different perspectives on that issue, and identify actions that might be taken.

Grade 7 Teachers

Curriculum Connections:

Unit A – Interactions & Ecosystems

- Investigate & describe relationships between humans and their environments, and identify related issues and scientific questions.
- Trace and interpret the flow of energy and materials within an ecosystem.
- Monitor a local environment and assess impacts of environmental factors on the growth, health, and reproduction of organisms within those environments.
- Describe the relationships among knowledge, decisions, and actions in maintaining life-supporting environments.

Unit B – Plants for Food & Fibre

- Investigate plant uses, and identify links between needs, technologies, products, and impacts.
- Investigate life processes and structures of plants, and interpret related characteristics and needs of plants in a local environment.
- Analyze plant environments and identify impacts of specific factors and controls.

****Note:** *Teachers may want students to cut out the last pages (27 & 28) of the student book before starting, as the answer key is included on those pages. The pages can be returned at the end of the program for students to fill out the Cases and membership card and check their answers.*

Activity #1 – Bug Hunt!

To become familiar with the booklet format, have students search for the four insects on the inside front cover that are hidden throughout the booklet.
Warren root-collar weevil, Cooley spruce gall adelgid, white-spotted sawyer beetle, aphid.

Discussion/Written Questions:

- What do these insects have to do with a trees & forests?

  Possible answers:

  live in/on forest trees,

  kill/feed on trees,

  food for other forest animals, part of the forest ecosystem

  **underlines that there is more than just trees in the forest*

- What topic is discussed on the page each insect is found on?

  weevil – abiotic and biotic things in the forest

  adelgid – 'alien invaders'

  sawyer beetle – tree identification

  aphid – users of the forest *(differing perspectives)*

***All of these topics will help us to understand trees and the forest ecosystem.*

Activity #2 – Wheel of Forests (back of booklet)

Have each student build their own EnviroKid's Wheel of Forests – it will be helpful for both the first activity and any field activities you decide to participate in using this resource, or even for just a walk in the woods.

Activity #3 – Where Oh Where Will Our Club House Go? (p. 2/3)

Go for a forest walk or bring in common *native* tree samples corresponding to the ones on the EnviroKid's Wheel of Forests. Using the wheel, have students try to identify four or five different trees.

Use the wheel as a starting point for discussing:

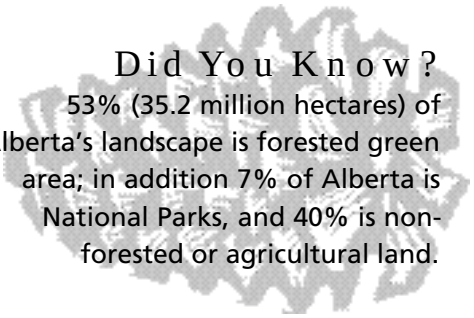
- leaf type – needle/broadleaf, simple/compound
- leaf shape – serrated/smooth margin, heart/oval/elliptical/lanceolate shape
- branching patterns – opposite, alternate
- deciduous/coniferous
- tree/shrub – slender/shrubby, conical, rounded crown

Categorize the samples and/or the plants listed on the wheel into groups based on these characteristics. For example, divide the trees into needleleaf (conifer) and broadleaf plants. Then divide the broadleaf plants into those with opposite and alternate leaf arrangement.

Now students can complete **Challenge #1** using the clues on page 2 & 3 of the booklet and the EnviroKid's Wheel of Forests.

Discussion/Written Questions:

- Explain why tamarack (larch) is both a conifer and a deciduous tree. (**coniferous because it has needle leaves and cones, deciduous because it drops its leaves for the winter**)
- If you were one of the EnviroKids, which tree would you put your treehouse in? Why? (**answers will vary – an example could be a spruce tree because it offers year-round coverage from snow/rain or a balsam poplar tree because it has lots of branches to rest the house on and does not have sharp needles**)



Did You Know?

53% (35.2 million hectares) of Alberta's landscape is forested green area; in addition 7% of Alberta is National Parks, and 40% is non-forested or agricultural land.

Activity #4 – Tree Works (p. 4/5)

After reading about how trees produce oxygen on student page 4, list all of the different components involved on the board. Have students discuss which components are 'ingredients' and which are 'products' in photosynthesis and divide them up on the board with a horizontal arrow.

water carbon dioxide sunlight ➲ oxygen sugar water

- Discuss where each of the components comes from (i.e. light from sun, water/nutrients from ground) and goes to (glucose/sugar goes to tree to become cellulose/fibre, oxygen and excess water released to air).
- Have students draw a picture of a tree in its natural setting (i.e. with sun, other plants, animals).
- Students can then use color-coded arrows showing where the different components of photosynthesis come from and go to (i.e. a blue arrow from under the ground, up through the roots and out to the leaves represents water).

Collect several 'tree cookies'***** for your class. In small groups, using the descriptions of the parts of a tree on page 4, have students find the various parts on the tree cookie (outer bark – if it's still on the cookie, phloem, cambium, xylem, heartwood). The cambium will be difficult to see, so encourage students to look very closely for the layer just inside the bark. On a recently cut tree, the sapwood will be easier to identify because there will probably be moisture still inside. Students can approximate where the sapwood and heartwood should be if tree cookies are older. They can use a strip of paper taped across the middle of the tree cookie to mark off each layer.

***Note:** *To make your own tree cookies, cut/saw 3-4 cm thick slices off a log or recently cut tree. Sand down each side until smooth.*

Tree Age – when trees grow, a new shoot starts to grow at the end of each branch, including the top of the tree. In addition to this shoot, new branches start to grow out from the base of the shoot, giving the tree and each branch a layered look.

- Take your students outside to, preferably, a short coniferous tree on the schoolyard or local forest area.

…more

- Beginning at the top of the tree, look closely at the first section – from the tip of the tree to the first layer or whorl of branches. You should notice that the bark is a lighter (and usually greener) color than the rest of the trunk/branches. You may also see a 'scar' or mark where the new shoot has grown out of the existing tree. Just above that should be the new lateral shoots.
- Students should be able to use both the whorls and branch scars to count back to the ground and estimate the age of the tree. Deciduous trees are much more difficult to count, as their elaborate branching patterns and indistinct top trunk make it difficult to count whorls (in that case, sometimes it's easier to just count the age of a large branch and say the tree is older than 'x' years).
- If possible, have students attempt to age at least 3 different types/sizes of trees in the schoolyard.

Extension – find out the diameter, circumference, and height of each tree.

- Compare the age and size characteristics and discuss whether older trees are necessarily bigger trees. Why or why not? *(often relative size can determine relative age, but many factors other than age will affect how tall/wide a tree will get)*
- What would affect the growth of a tree? *(competition, nutrients/water/sun, insects or disease, type of tree)*

Complete **Case #1** on page 5.

Activity #5 – All About Forests

The 'What's Missing?' language arts activity is a good springboard into the portion of the Activity Book concerning Forest Health. Once we know something about trees in a forest, we're ready to start understanding the complexity of the forest ecosystem.

For grade seven students, the activity is a quick start to discussing ecosystems. You may wish to modify the paragraph and post it up on a bulletin board as a summary of the entire Unit A:

An *ecosystem* is a living system where *living* and *non-living* things interact. It is a *complex community* with a variety of *habitats*. An ecosystem is in a constant state of change where a countless number of organisms interact in a food web. …*more*

Succession is the natural cycle of change in an ecosystem--whether it's a pond, a desert, or a forest. Understanding what stage of the cycle a forest is in can give you insight into the history of that site.

Discussion/Written Questions:

- What is an ecosystem? Define 'ecosystem' and list characteristics of ecosystems.
  Ecosystem – an interacting, life-supporting system that involves both living organisms and their physical environment; plants, animals, water, nutrients, sun, air – other answers may vary. Note: an ecosystem is not necessarily natural. A flowerpot or aquarium can also support an ecosystem.

- Why does succession take place?
  Organisms have different life cycles, life expectancy, and adaptations to their environment. Organisms that are best adapted to one set of conditions will survive and flourish for a period of time. As they flourish, they change the environment by creating or eliminating niches for other organisms, which in turn changes the ecosystem again.

- What starts a new cycle of stages in succession?
  Death of trees, usually from major disturbances – flooding, fire, extreme drought, major insect/disease outbreaks, harvesting.

- Why do grasses/wildflowers come back first after fire or other disturbance?
  These plants produce many small seeds that move in quickly from other areas, fast germinating seeds, sun-loving species that take advantage of the lack of tree cover; also many perennial plant roots survive fire.

- List a benefit of succession for the plants & animals in the forest.
  Opportunity for variety of species to survive at different times/different areas.

- List a drawback of succession for the plants & animals in the forest.
  Species need to adapt to changing conditions in order to survive – animals may need to move to neighboring forest areas that are in different stages of succession if their niches are lost.

…more

- Have students investigate one of the forest areas listed on pages 8-9. **Note: Error on page 8 of printed activity book (corrected in on-line version): there is no jack pine in a subalpine forest.** Draw a diagram similar to the one on page 6 mapping out the stages of succession for that forest area. Use the information below to help you figure out what stage of succession each plant is found in (some plants may be found in several stages):
    - Grasses – move in quickly, need high amounts of sun to survive
    - Shrubs (prickly wild rose, wild red raspberry, buffalo-berry, alder, willow) – usually sun-loving, some will remain under canopy of trees
    - Aspen poplar – sun-loving tree, early successional-mixed wood
    - Balsam poplar – sun-loving tree, early successional-mixed wood
    - Lodgepole pine – sun-loving tree, early successional-late successional
    - White spruce – sun or shade tolerant tree, early successional-late successional (goes from being a small understory plant to a dominant canopy tree)
    - Black spruce/tamarack – found most often in wet areas, can be long-lived, early successional-late successional
    - Balsam fir – shade tolerant tree, early successional-late successional (goes from being a small understory plant to a dominant canopy tree)
    - Douglas-fir, whitebark pine, Englemann spruce, alpine fir – all long-lived trees, early successional-late successional (also go from being small understory plants to dominant canopy trees)

Activity #6 – Fire: Friend or Foe (p. 7)

Have students read silently or orally the Fire: Friend or Foe section on page 7.

Fire also opens up niches for other organisms in the forest. After forest fire, wood-boring insects (like the white-spotted sawyer beetle from the beginning of the book) move in to break down the fire-damaged wood.

…more

Have students hypothesize about what happens to the animals when forest fire passes through their habitat. Have students take on the role of one animal. Write a story about what it's like as the fire passes through their home and the aftermath of the fire (i.e. how does the animal escape the fire, where does the animal find a place to live afterwards, what food is left). Check out the bottom of page 24 to find out how animals fare when forest fire passes through.

Discussion/Written Questions:

- Why is wildfire such an important part of our forest ecosystem?
  Helps balance the ecosystem – recycles nutrients, limits the spread of insects & disease, clears away dead/decaying plants to make room for new plants, helps with succession etc.
- Give an example of one Alberta tree that is highly adapted to wildfire – how is it adapted?
  Lodgepole/jack pine have serotinous cones that need heat to open them, Douglas fir has thick bark, aspen poplar/balsam poplar have more fire-resistant bark and also love sun so grow back quickly.
- If there was no fire in the forest, what would our forests look like?
  Very little recycling of minerals, thick, dense trees; thick buildup of dead/decaying plant material on the forest floor; lots of dead standing trees – as a result, when a fire did start, it could be catastrophic due to the amount of fuel available.
- If fire is good for the forest, why do we fight wildfires?
  To protect human lives, settlements and activities where fire threatens human lives & property. Most of Alberta's forests are designated for recreation, hunting, oil and gas development and forestry, and these values and properties need to be protected. However, the Alberta government deliberately starts fires in some safe areas to rejuvenate the forest (prescribed fire).
- Many Alberta wildfires are started by humans – what activities cause these fires?
  Carelessness with unattended campfires/debris burning, dropped cigarettes, playing with matches, as well as sparks from car exhaust, trains, or Off-Highway Vehicles. On average, 40% of fires in the Forest Protection Area in Alberta are human caused.

…more

- Are there things we can do to help prevent accidental human-caused wildfires?
  Educate and inform Albertans to not leave fires unattended, adhere to all fire ban regulations and/or be extra careful when conditions are very dry. If you see a fire in the forest, call the emergency wildfire reporting line toll free anywhere in Alberta at 310-FIRE.

Activity #7 – Take a Scenic Tour of Alberta's Forests (p. 8-11)

Read through the four forest areas and observe what plants and animals are found in each. **Note: Error on page 8 of printed activity book (corrected in on-line version): there is no jack pine in a subalpine forest.** Color-code an Alberta map for each forest region to put up on a bulletin board. Determine which forest region your town/city is in (or closest to).

Discussion/Written Questions:

- What animals and plants you would expect to find in your local forest area?
- Did you see any of these on your earlier forest walk? (if applicable)
- What other animals or plants are in your local area and not pictured in the Activity Book?
- What reasons would the EnviroKids have for setting up their clubhouse in the boreal forest?

In small groups, have students come up with stories that incorporate characteristics of each forest region and see if the other groups can figure out what region the story takes place in.

eg. As we hiked along a steep path through stands of lodgepole pine trees, the quiet squeak of a marmot greeted us from the nearby rocks. We hoped that we didn't hear the roar of a grizzly bear!!

Discuss the meaning of biotic and abiotic components of the ecosystem – answering the questions on page 10 of the Activity Book. Challenge students to come up with 10 more things to add to the list (either abiotic or biotic) that are found in one of Alberta's forests. Use the pictures on the previous pages for hints. Then continue on to **Challenge #2** to brainstorm about insects in the forest. …*more*

Once students have an understanding of the natural ecosystem components, let's start thinking about what happens when we add humans into the forest mix. Individually or as a group, brainstorm users of the forest, including plants & animals, for **Challenge #3**.

Activity #8 – Canadian Tree Products (p. 12)

Humans, like other organisms, are part of the forest ecosystem and also use trees. Trees are a renewable resource and there are many useful items and benefits that we derive from the forest. The word search on page 12 covers materials we create from the trees in the forest.

Our forests have to be managed sustainably to ensure that we get value from the forest without sacrificing the future survival of the forest ecosystem.

Discussion/Written Questions:

- After finishing the word search, brainstorm as a group other things that we use or take from the forest that are not necessarily just from the trees. (**eg. oil and gas, coal, gravel, animals for food, water is used to generate power**)
- Why do forests need to be managed by the government?
  To ensure more isn't taken from the forest than the forest can handle; there are so many different users that want something from the forest – if everyone took what they wanted, someone or something will lose out – animals, plants, water quality, recreation opportunities, trees for forest companies, etc.

Activity #9 – A Healthy Forest (p. 13-16)

Read the introduction on page 13 and work through **Challenge #4** on pages 14 & 15. Finish up with page 16, including **Case #2: The Case of the Exploding Bugs**.

From an ecological standpoint, a healthy forest is able to maintain its unique processes while providing for society's economic, social, recreational and spiritual needs and values. …*more*

Discussion/Written Questions:

- What does a 'healthy forest' mean to you?
- Which of the people who were interviewed fit your view of what a healthy forest is (you may have more than one answer for this)?
- Does having forest diseases and insects that damage or kill trees mean the forest is 'unhealthy'? Why or why not? (**a healthy forest ecosystem needs a balance of organisms where each has a role to play – forest insects and disease help break down old, dead, and decaying material in the forest; they also provide food for other animals; they are part of the biodiversity of a forest. If there are too many of these organisms and the balance is lost, that can create an unhealthy forest – although it may be a good way of starting the natural forest cycle of succession over again**)

Note: *In Alberta, forests are designated for various types of uses, like Provincial Parks, special land use zones, etc. About 40% of the forest area in Alberta (the Green Area) is designated for fibre production. This means sustainable fibre production is one forest management objective. In these areas, forest insects and disease outbreaks and impacts are major issues.*

Activity #10 – What is Buggin' the Forest? (p. 17)

As you discussed in the previous activity, having forest insects and diseases in the forest is necessary for continuing succession in the forest and for other ecological processes. We just want to keep the impact of the most destructive forest insects and diseases in check so that they do not cause an epidemic in areas we consider valuable. While forest disturbances vary in size, intensity, and frequency, they all influence biodiversity.

Having many trees dead or damaged by insects or diseases can affect all forest users. Insect infestations can increase the intensity of fire hazards, weaken trees (making them more susceptible to disease), alter wildlife habitat, impact watersheds and reduce recreational value. From an economic and social stand-point, having many of the forest trees dead or damaged by insects or diseases can affect the plans and revenue of forest companies and can affect the local economy of forestry-based communities. If the damage is severe, it can even affect Alberta's overall economy, as forestry is our third largest industry. Natural enemies such as birds, mammals, other insects, weather, parasites, bacteria, fungal or viral diseases, and other factors usually control insect populations. *…more*

Have students work through **Challenge #5** on page 17 to learn about the different types of insects that affect trees.

Discussion/Written Questions:

- Go back to page 10 and list all the insects that students came up with that have a role in the forest. Also, list the insects from the EnviroKid's Wheel of Forests. Do any of them fit into the six, tree-affecting categories? **(note: most students will probably only know defoliators like forest tent caterpillars and maybe, bark beetles e.g. mountain pine beetle)**
- Using the Important Forest Insects & Diseases of Alberta poster, students can examine the photos of each insect on the poster. Have students find one insect that primarily affects coniferous trees and one insect that primarily affects deciduous trees. List the insect, the damage it causes (hint: it will be one of the six categories discussed earlier), and whether outbreaks are common or uncommon. **Note: teachers can order the free 'Important Forest Insects & Diseases of Alberta' poster (see 'Additional Resources' at the back of this booklet) for this activity.**

Activity #11 – Invisible Enemies (p. 21)

Understanding that although insects are more easily viewed as pests in the forest, there are many other things that can affect trees just as effectively as insects. Diseases, weather conditions (like flooding or wind), or human effects (pollution) can damage or kill trees and impact forests, too. These invisible enemies, other than unpredictable weather conditions, are best controlled through prevention.

Read the instructions on page 21 and, in small groups, use the pictures to determine whether or not each one shows a disease or a disorder for **Challenge #6**.

Activity #12 – Pest Case Files (p. 18, 20, 22)

Assign each student one of the Case Files on pages 18, 20, or 22 – mountain pine beetle, forest tent caterpillar, dwarf mistletoe – to study in depth and then make an oral presentation on. They are now the expert forest entomologist (insects) or pathologist (diseases) on that particular pest. Their …*more*

job is to report to the Minister of Sustainable Resource Development on a recent outbreak in an area of the province. In their report (written or verbal), they need to cover the following:

- Where this outbreak is. (students pick a fictional area on the colored map from the 'Scenic Tour' activity and give a location relative to the nearest town. Students need to ensure that the location fits with the 'birth place' of the particular disease – i.e. Mountain pine beetle outbreak shouldn't be up near Ft. McMurray in the Boreal Forest but could be west of Canmore)
- What trees are affected and how it was realized that they were affected.
- How this outbreak will affect the natural ecosystem (both negative and positive effects) and humans. (industries that need the trees, activities that humans participate in throughout the forest)
- What they would like the government to do. (i.e. what methods of control could the Minister approve to help control the outbreak. Doing nothing is also an option, but students need to be clear on why they might pick that option)

Activity #13 – Alien Invaders (p. 23)

Have students read the press release on page 23 and answer **Challenge #7** on the same page.

Discussion/Written Questions:

- Why are exotic or alien species a threat to Alberta's forests?
  They upset the ecosystem balance – they can take over an area, and if there are no natural predators for that species, may squeeze out organisms native to the ecosystem; if growth and reproduction is unchecked, they may take over the whole ecosystem causing it to become unhealthy.
- List ways that exotic invasive species enter Alberta's forest ecosystems.
  Transported on weeds caught on boats or other vehicles brought into Alberta from other places, bringing in infested firewood from other provinces/states, buying non-native trees/shrubs out of the province that haven't been checked and planting them here, moving in/on packaging material of non-forest products coming from around the world.

…more

- Have students come up with an awareness advertisement (poster, radio advertisement, etc.) to help prevent exotic species from affecting Alberta's forest ecosystems. **Note: teachers may want to order the free 'Invasive Plants of Alberta' poster (see 'Additional Resources' at the back of this booklet) for further background for this activity.**
- Once all groups have presented their advertisements, have them devise a checklist of what they will remember to do the next time they are out with their families to prevent exotic species from negatively impacting Alberta's forests. Students can shrink some of their advertisements and the checklist into a newsletter to give to other students or send home to parents to make them aware of the problems with 'alien invaders'. Or, create an awareness bulletin board in your school. Some suggestions for the checklist:
    - *Brush seeds and bugs off clothes after going for a walk*
    - *Clean mud, grass, plants from ATVs or boats before driving home*
    - *Plant only approved trees or plants in your yard or garden*
    - *Leave plants and animals where you see them (take pictures or draw them instead)*
    - *Don't take firewood from campgrounds or bring firewood from home*
    - *Don't release exotic pets into the wild*
    - *Inspect your camper, outdoor equipment, toys, and furniture for "visitors" including egg masses, pupae or seeds*
    - *Report suspicious pest findings to your nearest Alberta Sustainable Resource Development office*

Activity #14 – Who Dunnit? (p. 24 & 25)

Although we've spent a lot of time talking about the insects and diseases in the ecosystem and the damage they can cause to a single tree or a large forest (if they are not controlled), what about other parts of the ecosystem that affect trees? If students are very observant, they may be able to distinguish insect & disease damage from that of larger animals. Work through **Challenge #8** on pages 24 & 25 to get a better understanding of what evidence indicates animals have done damage to trees in the forest.

Take another local forest walk (or work this into the same forest hike you started out the unit/workbook with), bringing the EnviroKids Wheel of Forests with you. Students should also have a chart, similar to the following, to fill out on the walk:

Tree Damage

Insect Damage	Disease Damage	Animal Damage
Eg. Small tunnels (galleries) under bark on fallen log (bark beetles)	*Eg. Black fungus on leaves of Saskatoon shrub*	*Eg. Chewed branches and cones on the ground (squirrel)*

Students should try and use their Wheel of Forests and the knowledge they've gained over the course of their activities to help them figure out what insect, disease, and animal damage is in the forest.

Discussion/Written Questions:

- List each insect, disease, or animal damage that was encountered on your forest walk (or, if you didn't go outside, pick ten examples from pages 17, 21, and 24).
- Discuss how each example of damage both benefits and hampers the tree and/or ecosystem as a whole. (**provides food for other animals, breaks down dead/old trees and makes room for new trees, returns nutrients to the ground, distributes seeds to other parts of the forest**)

(Optional Activities)

If you have time, do **Case #3** (page 19) and **Case #4** (page 26) and have students finish up by filling out their summary answers and their membership card on page 27. *(hand sheets back out to students)*

Additional Resources:

*(*denotes a 'low cost' resource, all others are free)*

From Alberta Sustainable Resource Development Information Centre
To order: 780-944-0313 or http://www3.gov.ab.ca/srd/info/publist.cfm

- Important Forest Insects and Diseases of Alberta poster *(note: this is a double-sided poster)*
- Management of Woodborers in Coniferous Logs brochure
- Native Trees of Alberta poster
- Invasive Plants of Alberta poster

From Alberta Sustainable Resource Development – Forest Health Section
To order: fh.info@gov.ab.ca

- Forest Health video/print series on Armillaria Root Disease, Dwarf Mistletoe, and Juvenile Conifer Stand Health (for teacher use only)*

From Alberta Community Development
To order: (780) 427-5138 or Cyndy.Jones@gov.ab.ca

- Natural Regions of Alberta poster series (poster set and information resource of the 6 natural regions in Alberta – Canadian Shield, Northern (Boreal) Forest, Aspen Parkland, Grasslands, Foothills, Rocky Mountains)*

From the Canadian Forest Service – Natural Resources Canada
To order: 780-435-7210 or inquiries@nofc.forestry.ca

- Forest Regions of Canada poster
- Forestry Leaflet series *(covers information on many different forest insects & diseases)*

From Inside Education
To order: 780-421-1497 or http://www.insideeducation.ca

- Between the Stands poster kit *(posters – with managed/unmanaged forest, tree dichotomous key, forest regions of Canada/Alberta, tree diagrams; activities related to trees & forests)*
- Boreal Forest video series – 3 videos *(covers forest ecology, management, economic/social/ environmental perspectives)**
- Exploring Our Forests field kit*
- Guide to the Common Native Trees & Shrubs of Alberta*
- Forest Field Trip video series – 2 videos *(visit harvesting site, pulp mill, sawmill, regeneration site; look at forest fire, forest research, specialty wood products, natural and human effects on the forest)**

From UBC Press
To order: 1-877-864-8477 or orders@gtwcanada.com

- *A Field Guide to Forest Insects & Diseases of the Prairie Provinces* – ISBN 06601-59481*

From Lone Pine Publishing
To order: visit local bookstore or grocery store

- Plants of the Western Boreal Forest & Aspen Parkland – ISBN 1-555105-058-7*
- Trees & Shrubs of Alberta – ISBN 0-919433-39-1*

From Alberta-Pacific Forest Industries
To order: 1-800-661-5210

- In the Steps of Nature brochure/poster
- Research in the Canadian Boreal Forest: A Foundation for Better Woodlands video*
- Online programming – www.alpac.ca/public_involvement/EducationPrograms.htm

WebQuest

***Note:** *website addresses were accurate at time of printing – use a search engine for updated website information.*

For more information about forest health in Alberta's forests, visit:
http://www3.gov.ab.ca/srd/forests/health
(See Publications – Educational Materials – See especially "Focus on Forest Health")

To find out more about more about forest fires & forest protection, visit:
http://envweb.env.gov.ab.ca/env/forests/fpd

To find out more about Alberta Natural Heritage Information, visit:
http://www.cd.gov.ab.ca/preserving/parks/anhic

To find out more about wildlife and biodiversity, visit:
http://www3.gov.ab.ca/srd/fw

To find out more about invasive species, visit:
http://www.inspection.gc.ca/english/toce.shtml

Some other organizations you may be interested in:

Alberta Forest Products Association	http://www.albertaforestproducts.ca
Canadian Forests	http://www.canadian-forests.com
Canadian Forest Service	http://www.nrcan.gc.ca/cfs-scf
Canadian Nature Federation	http://www.cnf.ca
Canadian Parks & Wilderness Society	http://www.cpaws.org
Canadian Pulp & Paper Association	http://www.cppa.org/english
Environment Canada's Green Lane	http://www.ec.gc.ca
Federation of Alberta Naturalists	http://www.fanweb.ca
Foothills Model Forest	http://www.fmf.ab.ca
Inside Education *(formerly FEESA)*	http://www.insideeducation.ca
Science Alberta Foundation – Wonderville	www.wondervillle.ca
Temperate Rainforest Foundation	http://www.forestinfo.org
Woodlinks	http://www.woodlinks.com

Some online interactive activities:

National Geographic Fantastic Forest	http://www.nationalgeographic.com/features/96/forest
Pencil Pages	http://www.pencils.com
Smokey the Bear	http://www.smokeybear.com
Virtual Forestry Library	http://www.metla.fi/info/vlib/Forestry