“Look Down in the Woods”
Multidisciplinary Classroom Activities

Teachers guide for the Young Naturalists article “Look Down in the Woods,” by Mary Hoff. Published in the May–June 2006 Minnesota Conservation Volunteer, or visit www.dnr.state.mn.us/young_naturalists/forest_floor.

Young Naturalists teachers guides are provided free of charge to classroom teachers, parents, and students. This guide contains a brief summary of the article, suggested independent reading levels, word count, materials list, estimates of preparation and instructional time, academic standards applications, preview strategies and study questions overview, adaptations for special needs students, assessment options, extension activities, Web resources (including related Conservation Volunteer articles), copy-ready study questions with answer key, a copy-ready vocabulary sheet, and vocabulary study cards. There is also a practice quiz (with answer key) in Minnesota Comprehensive Assessments format. Materials may be reproduced and/or modified to suit user needs. Users are encouraged to provide feedback through an online survey at www.dnr.state.mn.us/education/teachers/activities/ynstudyguides/survey.html.

Summary
“Look Down in the Woods” catalogs 10 common plants found in Minnesota’s forests. Readers learn the common and scientific names, habitat requirements, and physical characteristics of each species, as well as which ones provide food for animals and people. Accompanying photos provide an excellent field guide.

Suggested reading levels: mid-elementary through eighth grade
Total words: 1,120
Materials: Paper, poster board, pencils, pens, markers, and print resources from your media center, plants of Minnesota field guide

Preparation time: One to two hours (not including extension activities)

Estimated instructional time: Two to three 50-minute class periods (not including extension activities)

Minnesota Academic Standards applications: “Look Down in the Woods” may be applied to the following Minnesota Department of Education Academic Standards:

Language Arts
I. Reading and Literature
   A. Word Recognition, Analysis and Fluency
   B. Vocabulary Expansion
   C. Comprehension
II. Writing
   A. Types of Writing
   B. Elements of Composition
   C. Spelling
   D. Research
   E. Handwriting and Word Processing
III. Speaking, Listening and Viewing
   A. Speaking and Listening
   B. Media Literacy

Arts
Artistic Expression: Visual Arts

Science
Grade 3
IV. Life Science
   B. Diversity of Organisms
   C. Interdependence of Life
Grade 4
IV. Life Science
   B. Diversity of Organisms
Grade 5
IV. Life Science
   E. Biological Populations
      Change Over Time
   F. Flow of Matter and Energy
Grade 7
IV. Life Science
   B. Diversity of Organisms
   C. Interdependence of Life
   E. Biological Populations
      Change Over Time
   F. Flow of Matter and Energy

Complete Academic Standards are available at www.education.state.mn.us.
Teachers who find other connections to academic standards are encouraged to contact Minnesota Conservation Volunteer.

Preview

Begin your preview with a survey of the article. Ask your students to examine the photos. Then pass out Wint O Green Life Savers. After students have tasted each, ask where the flavoring comes from. Use the KWL strategy (Ogle, 1986) to find out what your students already know (K) about forest-floor plants; what they want (W) to learn, and eventually, what they learned (L) while reading the article and related materials, and
through participating in extension activities. Display your K and W ideas on poster board or paper (see Vocabulary preview, below). Add to your L list as you read and discuss the article. See www.teach-nology.com/web_tools/graphic_org/kwl for a KWL generator that will produce individual organizers for your students. You may also introduce your students to one of several field guides that catalog plant life. See Minnesota’s Bookstore for Field Guide to the Native Plant Communities of Minnesota: The Eastern Broadleaf Forest Province and Field Guide to the Native Plant Communities of Minnesota: The Laurentian Mixed Forest Province at www.dnr.state.mn.us/publications/books, or consult your school media center or local public library.

**Vocabulary preview**

You may wish to review the attached list as well as any other words based on knowledge of your students’ needs. Many connections to vocabulary in the article may be made during the KWL activity. Ask students to highlight the italicized words in the story. These are key concepts and should be discussed before reading. Perhaps some of these terms are included in your K list. If students are not familiar with some of the terms, include them in the W list. Eventually, they can be moved to the L list. You may write vocabulary from the article in green ink, while other ideas are written in black. You may wish to use the study cards found at the end of this guide. Study cards (Hock, Deshler, and Schumaker, 2000) can be applied to any subject area. Cut along the horizontal lines, fold in the middle and tape or staple. Blanks are provided to allow you or your students to add new words or phrases. On one side of the card, in large letters, write a key word or phrase from the article that students are expected to know. In smaller letters frame the word or phrase in a question or statement. On the other side of the card, in large letters, write the answer or match to the question or statement. Finally, in smaller letters, frame the answer in a question or statement.

**Study questions overview**

Study questions parallel the story (the answer to the first question appears first in the article, followed by the second, and so on). Preview the entire guide with your class before you read the article. You may wish to read the story aloud and complete the study questions in class, in small groups, or as an independent activity. The questions may be assigned as homework, depending on the reading ability of your students. Inclusion teachers may provide more direct support to special needs students (see Adaptations section, below). The study questions may also be used as a quiz. Note: Items 3, 4, 12, and 13 and the challenge require analytical thinking.

**Adaptations**

Read aloud to special needs students. Abbreviate the study questions or highlight priority items to be completed first, for example, items 1, 2, 5, 6, 9, and 14. If time allows, remaining items may be attempted. Peer helpers, paraprofessionals, or adult volunteers may lend a hand with the study questions. With close teacher supervision, cooperative groups can also offer effective support to special needs students, especially for extension activities.
Assessment

You may use all or some of the study questions, combined with vocabulary, as a quiz. Other assessment ideas: (1) Students may write an essay describing a selected species, to include details regarding appearance, habitat, propagation, and food properties. (2) Students may sketch one or more species observed during a field trip (see Extension activities) and then make positive identifications with field guides. (3) Poster presentations may illustrate the interrelationships of trees and forest floor plants. (4) On a field trip (see Extension activities) students may identify plants from the article as well as others from field guides. (4) Challenge students to match scientific names to common names.

Extension activities

1. A field trip to a nearby school forest, state park, or nature area will give students the opportunity to identify some or all of the plants in the article, as well as many other plants in field guides. (See www.dnr.state.mn.us/schoolforests/listing.html for a list of school forests, or www.dnr.state.mn.us/state_parks for a list of state parks.)

2. Plants, like animals, can become endangered. See www.dnr.state.mn.us/ets/vascular_endangered.html for a list of endangered plants in Minnesota. The site www.fws.gov/endangered/Kids provides many excellent activities specific to endangered species. See “Plants in Peril” lesson plans.


4. Scientific nomenclature may interest your advanced students. See en.wikipedia.org/wiki/Binomial_nomenclature for an excellent introduction to the logic behind the system.

Web resources

Related Minnesota Conservation Volunteer articles (see www.dnr.state.mn.us/volunteer/articles) include:

January–February 2006
“Lichens: Two Lives in One”

May–June 2005
“A Fondness for Ferns”

July–August 2004
“Western Poison Ivy”
“The Rare Ones”

January–February 2003
“Where’s Nature in the Twin Cities?”

March–April 2002
“Plants That Eat Animals” (YN article with teachers guide)
“Paper Birch”

July–August 2001
“Western Prairie Fringed Orchid”

November–December 2000
“High-bush Cranberry”
May–June 2000
“Prairie Wild Rose”

July–August 1998
“The Trouble With Backyard Buckthorn”
“Last Stands of Big Woods”

References

Study Questions
“Look Down in the Woods,” by Mary Hoff
Minnesota Conservation Volunteer, May–June 2006
www.dnr.state.mn.us/young_naturalists/forest_floor

Name ____________________________ Period _______ Date ______________

1. Why might you miss some of the more interesting sights in the forest?
   ________________________________________________________________
   ________________________________________________________________

2. You probably won’t find bunchberry plants growing under maple trees. Why not?
   ________________________________________________________________

3. How do rhizomes help plants that animals eat?
   ________________________________________________________________

4. Can you think of another reason rhizomes could mean the difference between survival and
   extinction?
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________

5. How do birds help sarsaparilla propagate?
   ________________________________________________________________

6. Ground-pine looks like a pine tree, but it is actually a ____________________________.

7. Ground-pine is used for ____________________________ and ____________________________.

8. Are you likely to find starflowers in bloom in August? Why or why not?
   ________________________________________________________________

9. Where does baneberry get its name?
   ________________________________________________________________

10. Describe the pattern of leaves on a Streptopus roseus stalk.
    ________________________________________________________________

11. Is it likely you will find rose twisted-stalk in a pine forest? Why or why not?
    ________________________________________________________________

12. Are wintergreen berries white or red?
    ________________________________________________________________

13. What does Clintonia borealis have in common with Actaea rubra?
    ________________________________________________________________
14. Explain how wild strawberries differ from the strawberries you buy at the grocery store.

___________________________________________________________________________________
___________________________________________________________________________________

15. *Aster* is from the Latin word for __________________________________________________.

Challenge: Classify the 10 plants in this article by habitat, propagation, and toxicity. Which one is in a category if its own?
Study Questions Answer Key

“Look Down in the Woods,” by Mary Hoff

Minnesota Conservation Volunteer, May–June 2006

www.dnr.state.mn.us/young_naturalists/forest_floor

1. Why might you miss some of the more interesting sights in the forest? Many interesting and beautiful plants grow on the forest floor. If you don’t look down, you will miss them.

2. You probably won’t find bunchberry plants growing under maple trees. Why not? Bunchberries prefer a coniferous forest floor.

3. How do rhizomes help plants that animals eat? Once the parts of the plant above ground are eaten, the plant has no way to reproduce unless it can begin new growth from its root system.

4. Can you think of another reason rhizomes could mean the difference between survival and extinction? When tops of plants are destroyed or damaged in fires, rhizomes are able to send up new growth.

5. How do birds help sarsaparilla propagate? They eat the berries, fly away, and deposit the seeds in their droppings.

6. Ground-pine looks like a pine tree, but it is actually a fern.

7. Ground-pine is used for decorations and medicine.

8. Are you likely to find starflowers in bloom in August? Why or why not? No. Star flowers bloom in May and June.


10. Describe the pattern of leaves on a Streptopus roseus stalk. The leaves on this plant do not grow opposite one another on the stalk, but are staggered.

11. Is it likely you will find rose twisted-stalk in a pine forest? Why or why not? No. Rose twisted-stalk prefers a deciduous forest.

12. Are wintergreen berries white or red? Both. Wintergreen berries are white in spring and turn red by late summer.

13. What does Clintonia borealis have in common with Actaea rubra? The berries are toxic.

14. Explain how wild strawberries differ from the strawberries you buy at the grocery store. They are much smaller than farm-grown berries and are also sweeter.

15. Aster is the Latin word for star.

Challenge: Classify the 10 plants in this article by habitat, propagation, and toxicity. Which one is in a category if its own? This item would make a good poster. Ground pine is in its own category.
Minnesota Comprehensive Assessments Practice Items

“Look Down in the Woods,” by Mary Hoff
Minnesota Conservation Volunteer, May–June 2006
www.dnr.state.mn.us/young_naturalists/forest_floor

Name ___________________________________________ Period _____ Date_________________

1. _______________ is a favorite food of spruce grouse.
   A. *Aralia nudicaulis*
   B. Bunchberry
   C. Baneberry
   D. *Streptopus roseus*

2. _______________ is easily identified by its pink-striped, bell-shaped flowers.
   A. *Streptopus roseus*
   B. Ground pine
   C. Wintergreen
   D. *Fragaria virginiana*

3. This plant has much in common with its domesticated cousin.
   A. miniature pine
   B. scootberry
   C. wild strawberry
   D. wild sarsaparilla

4. Forest-floor plants are found in ________________________________ .
   A. wetlands
   B. both coniferous and deciduous forests
   C. city parks
   D. deserts

5. Rhizomes are important because ________________________________ .
   A. they hold plants to the ground
   B. they provide a way for plants to reproduce if flowers are destroyed
   C. they keep predators away
   D. they are difficult to find
1. **B. Bunchberry** is a favorite food of spruce grouse.

2. **A. Streptopus roseus** is easily identified by its pink-striped, bell-shaped flowers.

3. This plant has much in common with its domesticated cousin. **C. wild strawberry**

4. Forest-floor plants are found in **B. both coniferous and deciduous forests**.

5. Rhizomes are important because **B. they provide a way for plants to reproduce if flowers are destroyed**.
Vocabulary
“Look Down in the Woods,” by Mary Hoff
Minnesota Conservation Volunteer, May–June 2006
www.dnr.state.mn.us/young_naturalists/forest_floor

- **acidic**  sour or sharp to the taste
- **azure**  sky blue
- **coniferous**  mostly evergreen trees and shrubs with true cones
- **deciduous**  trees that lose their leaves in fall
- **disk**  flat, round object, like a plate
- **leaflets**  small, young leaves
- **millisecond**  one one-thousandth of a second
- **miniature**  small
- **oval**  elongated circle
- **parallel**  straight lines that run in the same direction
- **pollinate**  transfer pollen from one flower to another
- **rhizomes**  lumps or masses on a plant’s root that send up new growth
- **toxic**  poisonous
**vireo**  small, gray-green bird found in Minnesota forests

**whorl**  leaves arranged in a circle
Vocabulary Study Cards
“Look Down in the Woods,” by Mary Hoff
Minnesota Conservation Volunteer, May–June 2006
www.dnr.state.mn.us/young_naturalists/forest_floor

Cut along the horizontal lines, fold in the middle and tape or staple. Blanks are provided to allow you or your students to add new words or phrases.

<table>
<thead>
<tr>
<th>An object is miniature when it is</th>
<th>A small version of a larger object is called a</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What does coniferous mean?</th>
<th>A tree or shrub that has cones is</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>When soil is acidic, it</th>
<th>If soil is high in acid, it is</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>What is a <strong>vireo</strong>?</td>
<td><strong>What is a small gray-green bird of the forests of Minnesota</strong> called?</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>An azure</strong> butterfly is the color of <strong>the blue sky</strong>.</td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>When a substance is <strong>toxic</strong>, it is</td>
<td>What is a substance that is <strong>poisonous</strong> called?</td>
</tr>
<tr>
<td>When lines are <strong>parallel</strong>, they</td>
<td>When two lines <strong>run in the same direction at a constant distance apart</strong>, they are</td>
</tr>
<tr>
<td>What are <strong>deciduous</strong> trees?</td>
<td>What are <strong>trees that lose their leaves in the fall</strong> called?</td>
</tr>
<tr>
<td>What are leaflets?</td>
<td>What are small leaves called?</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>An oval-shaped object is</td>
<td>An elongated circle is an</td>
</tr>
<tr>
<td>A disk is</td>
<td>A flat, round object is a</td>
</tr>
</tbody>
</table>