Chapter 1: Tree Basics

1. Trees have three main parts: ____________________, ____________________, and ____________________.

2. Three types of cells make up the trunk of a tree
   The ____________________ cells make up the bulk of the tree and the annual rings; these cells move water and nutrients between the roots and the leaves. The ____________________ cells move sugar and other substances between the leaves and the roots. The ____________________ cells are in a very thin layer between the two types of cells named above. This layer is so thin it can only be seen with a microscope.

3. Trees are divided into two groups:
   ____________________ trees shed their leaves each fall and grow new leaves each spring.
   ____________________ trees have needlelike or scaly leaves that are shed as the leaves age and not all at once.

4. Of the two types of trees above, the term “softwoods” refer to ____________________ trees and the term “hardwoods” refer to ____________________ trees.

5. Because of the way trees grow taller, if you were to drive a spike into the trunk of a sapling exactly 3 feet from the ground and come back 30 years later, were you would you find the spike? (Circle the letter of the correct answer.)
   A. Less than 3 feet from the ground
   B. Exactly 3 feet from the ground.
   C. More than 3 feet from the ground
   D. From 6 to 12 feet from the ground, depending on the species of tree.

6. Fall colors of trees vary from year to year depending on the ____________________ and ____________________ conditions before and during the time when chlorophyll in the leaves dwindles away.

7. Three species of trees that are able to survive in temperatures as low as -100°F (-73°C) are ____________________, ____________________, and ____________________.
8. Each species of tree has unique characteristics that allow it to grow and thrive best under a given set of conditions. Conditions that affect tree growth include (check all that apply):

___ Sunlight  
___ Moisture  
___ Slope  
___ Temperature  
___ Soil type

Chapter 2: Forest Ecosystems

1. A forest ecosystem is made up of several components, both living (biotic) and nonliving (abiotic). In the list below, put an “L” next to the living components of a forest ecosystem and an “N” next to the nonliving components:

___ Soil  ___ Plants  
___ Trees  ___ Water  
___ Landforms  ___ Air  
___ Animals

2. Forests contain several different heights or layers of plants, with different animals often found within each layer. Draw a line from each group of animals in the left column to the forest layer in which it is most likely to be found.

<table>
<thead>
<tr>
<th>ANIMALS</th>
<th>WHERE FOUND?</th>
</tr>
</thead>
<tbody>
<tr>
<td>White-tailed deer, black flies and mosquitoes</td>
<td>Canopy</td>
</tr>
<tr>
<td>Eagles and bats</td>
<td>Understory</td>
</tr>
<tr>
<td>Mice, insects and snakes</td>
<td>Shrub layer</td>
</tr>
<tr>
<td>Insects, bacteria and fungi</td>
<td>Herb Layer</td>
</tr>
<tr>
<td>Birds and red squirrels</td>
<td>Forest Floor</td>
</tr>
</tbody>
</table>

3. The Canada lynx is an example of a (circle one) SPECIALIST / GENERALIST because it can thrive only in large tracts of relatively undeveloped forests.

4. The raccoon is an example of a (circle one) SPECIALIST / GENERALIST because it can thrive in a wide range of habitat types.

5. As environmental conditions change, the types of plants, shrubs and trees that make up a forest may also change. This process is called ____________________.
Chapter 3 Forests Before Settlement

1. About 20,000 years ago, a glacier covered all of Minnesota except which part? The ________________ corner.

2. The first species of tree to move in as the glaciers retreated, perhaps 10,000 or 11,000 years ago, were ________________.

3. When Europeans began settling in Minnesota about 1800, a portion of the state was prairie and another portion was forest. About what percentage of the state was forest at that time? (circle one) 30% 60% 90%

4. Minnesota has four biomes – regional ecosystems characterized by the plant, animal, and microbial communities that have developed under specific soil and climate conditions. Minnesota’s four biomes are: ________________, ________________, ________________, and ________________.

5. In Minnesota, much of the land located the northeast section is ________________ forest.

6. The biome that is fairly small in Minnesota but extends north into the Canadian provinces of Manitoba, Saskatchewan, and Alberta is the ________________ biome.

7. A 3,000 square mile area known as the Big Woods is part of the ________________ biome.

8. Of Minnesota’s four biomes, which one gets the least precipitation on average? ________________.

9. Which biome has the lowest average temperature? ________________.

10. Archeologists have found evidence of human activity in McCarthy Beach State Park near Hibbing dating back to ________________ years ago.

11. Before European explorers arrived, American Indians used fire to manage the land (circle one) A lot Occasionally Almost never

All About Minnesota’s Forests and Trees: A Primer
Quiz written by the Minnesota Department of Natural Resources and the Minnesota Forestry Association
Changes in the Forest since 1800

1. Some historians view the construction of Minnesota’s first sawmill on the Mississippi River at St. Anthony Falls in the year ______ as the beginning of Minnesota’s logging era.

2. The heyday of logging in Minnesota was from about ______ to ______.

3. During the logging era, loggers did not even consider planting new trees because they thought they were clearing land for (circle one):
   - Cities
   - Farms
   - Recreation
   - Hunting
   - Buffalo

4. “L”-shaped lines of trees which are wrapped around the windward side of homes and farm buildings are called ____________________.

5. The ____________________________________________, established in 1876, is Minnesota’s first forest conservation organization. Today it is known as the ___________________________ or MFA for short.

6. Name the Year:
   - ______ Minnesota’s first sawmill opens at St. Anthony Falls.
   - ______ Treaties with American Indians open most of Minnesota for logging.
   - ______ Minnesota gains statehood.
   - ______ Logging production hits an all-time peak: 2 billion board feet of lumber produced.
   - ______ Chippewa National Forest is established. (Superior National Forest was established one year later.)
   - ______ Red pine, also known as the Norway pine, is named Minnesota’s “State Tree”

7. Of Minnesota forest fires, which one burned the most acres and killed the most people?
   _______________________________
Chapter 5 Forests Today

1. While most of the forests have been cleared in southern Minnesota for farming, we still have _______ million acres of forested land, which is about ½ of the original total. The forest we still have in place cover about _______ of Minnesota’s land area.

2. Forest management today is increasingly focused on stewardship, multiple benefits and sustainability. Those who care for Minnesota’s forests recognize that (see page 29):
   a. This resource is to be __________________ but not ___________________.
   b. ______________ needs are to be balanced with other goals.
   c. Current demands must be compatible with our responsibility to ______________ __________________.

3. Of today’s 16.3 million acres of forest land in Minnesota:
   _____% is owned by private citizens
   _____% is owned by private industry and corporations
   _____% is the total owned by state, federal and county/municipal governments.

4. Check those items below that represent a benefit provided by today’s forests:
   _____ Timber  _____ Carbon Sequestration (absorbing carbon dioxide from the air and storing it in roots, stems, branches and foliage)
   _____ Nontimber products  _____ Recreation
   _____ Jobs  _____ Aesthetics (adding beauty to our surroundings)
   _____ Wildlife habitat  _____ Energy from Woody Biomass
   _____ Biological Diversity  (burning trees, plants and associated residues to generate heat or electricity)
   _____ Cultural resources
   (historic burial grounds, large or very old trees, etc.)
   _____ Water and Air Quality

5. List the tree species from which the products listed below are made:

<table>
<thead>
<tr>
<th>Tree Species</th>
<th>Timber Products</th>
<th>Nontimber Products</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pulp for paper; Christmas trees</td>
<td>Christmas (seasonal) wreaths</td>
</tr>
<tr>
<td></td>
<td>Furniture, cabinets, railroad ties</td>
<td>Firewood</td>
</tr>
<tr>
<td></td>
<td>Pulp for paper (more pulp is made from this tree species than all others combined), oriented strand board (similar to plywood), paneling</td>
<td>Walking sticks</td>
</tr>
</tbody>
</table>
Chapter 6 Forests Tomorrow

1. Can you love the earth and cut trees too? Yes because trees are a _______________ resource.

2. From the Forestry-related careers listed on pages 41 and 42, list the two that sound most interesting to you:
   1. ________________________________
   2. ________________________________
All About Minnesota’s Forests and Trees: A Primer
Quiz

Chapter 1: Tree Basics

1. Trees have three main parts: _crown_, _trunk_, and _roots_.

2. Three types of cells make up the trunk of a tree
   - The ____ xylem _______ cells make up the bulk of the tree and the annual rings; these cells move water and nutrients between the roots and the leaves.
   - The ____ phloem _______ cells move sugar and other substances between the leaves and the roots.
   - The ____ cambium _______ cells are in a very thin layer between the two types of cells named above. This layer is so thin it can only be seen with a microscope.

3. Trees are divided into two groups:
   - ____ Deciduous ______ trees shed their leaves each fall and grow new leaves each spring.
   - ____ Coniferous _______ trees have needlelike or scaly leaves that are shed as the leaves age and not all at once.

4. Of the two types of trees above, the term “softwoods” refer to ____ deciduous _______ trees and the term “hardwoods” refer to ____ coniferous _______ trees.

5. Because of the way trees grow taller, if you were to drive a spike into the trunk of a sapling exactly 3 feet from the ground and come back 30 years later, were you find the spike? (Circle the letter of the correct answer.)
   - B. Exactly 3 feet from the ground

6. Fall colors of trees vary from year to year depending on the _temperature_ and _moisture_ conditions before and during the time when chlorophyll in the leaves dwindles away.

7. Three species of trees that are able to survive in temperatures as low as -100°F (-73°C) are ____ black spruce ____, _______ balsam fir _______, and _____ quaking aspen ___.

All About Minnesota’s Forests and Trees: A Primer
Quiz written by the Minnesota Department of Natural Resources and the Minnesota Forestry Association
8. Each species of tree has unique characteristics that allow it to grow and thrive best under a given set of conditions. Conditions that affect tree growth include (check all that apply):
- Sunlight
- Moisture
- Slope
- Temperature
- Soil type

Chapter 2: Forest Ecosystems

1. A forest ecosystem is made up of several components, both living (biotic) and nonliving (abiotic). In the list below, put an “L” next to the living components of a forest ecosystem and an “N” next to the nonliving components:

   - Soil
   - Trees
   - Landforms
   - Plants
   - Water
   - Air
   - Animals

2. Forests contain several different heights or layers of plants, with different animals often found within each layer. Draw a line from each group of animals in the left column to the forest layer in which it is most likely to be found.

   **ANIMALS**
   - White-tailed deer, black flies and mosquitoes
   - Eagles and bats
   - Mice, insects and snakes
   - Insects, bacteria and fungi
   - Birds and red squirrels

   **WHERE FOUND?**
   - Canopy
   - Understory
   - Shrub layer
   - Herb Layer
   - Forest Floor

3. The Canada lynx is an example of a (circle one) **SPECIALIST** because it can thrive only in large tracts of relatively undeveloped forests.

4. The raccoon is an example of a (circle one) **GENERALIST** because it can thrive in a wide range of habitat types.

5. As environmental conditions change, the types of plants, shrubs and trees that make up a forest may also change. This process is called **Succession**.
Chapter 3 Forests Before Settlement

1. About 20,000 years ago, a glacier covered all of Minnesota except which part? The southeast_____ corner.

2. The first species of tree to move in as the glaciers retreated, perhaps 10,000 or 11,000 years ago, were _spruce_.

3. When Europeans began settling in Minnesota about 1800, a portion of the state was prairie and another portion was forest. About what percentage of the state was forest at that time? (circle one) 60%  

4. Minnesota has four biomes – regional ecosystems characterized by the plant, animal, and microbial communities that have developed under specific soil and climate conditions. Minnesota’s four biomes are: _____ deciduous __, _____ coniferous __, _tallgrass aspen parkland___, and ____ prairie grassland_____.

5. In Minnesota, much of the land located the northeast section is _coniferous _ forest.

6. The biome that is fairly small in Minnesota but extends north into the Canadian provinces of Manitoba, Saskatchewan, and Alberta is the _tallgrass aspen parkland_ biome.

7. A 3,000 square mile area known as the Big Woods is part of the _deciduous_ biome.

8. Of Minnesota’s four biomes, which one gets the least precipitation on average? _tallgrass aspen parkland_.

9. Which biome has the lowest average temperature? _____ _coniferous _________.

10. Archeologists have found evidence of human activity in McCarthy Beach State Park near Hibbing dating back to ___10,000__ years ago.

11. Before European explorers arrived, American Indians used fire to manage the land (circle one)  

   A lot
Changes in the Forest since 1800

1. Some historians view the construction of Minnesota’s first sawmill on the Mississippi River at St. Anthony Falls in the year ___1821___ as the beginning of Minnesota’s logging era.

2. The heyday of logging in Minnesota was from about ___1890___ to ___1930___.

3. During the logging era, loggers did not even consider planting new trees because they thought they were clearing land for (circle one): 

   Farms

4. “L”-shaped lines of trees which are wrapped around the windward side of homes and farm buildings are called ____shelterbelts___.

5. The _Minnesota State Forestry Association_, established in 1876, is Minnesota’s first forest conservation organization. Today it is known as the _Minnesota Forestry Association_ or MFA for short.

6. Name the Year:

   _1821_ Minnesota’s first sawmill opens at St. Anthony Falls.
   _1837_ Treaties with American Indians open most of Minnesota for logging.
   _1858_ Minnesota gains statehood.
   _1899_ Logging production hits an all-time peak: 2 billion board feet of lumber produced.
   _1908_ Chippewa National Forest is established. (Superior National Forest was established one year later.)
   _1953_ Red pine, also known as the Norway pine, is named Minnesota’s “State Tree”

7. Of Minnesota forest fires, which one burned the most acres and killed the most people? 

   _____ Cloquet – Moose Lake Forest Fire _____
Chapter 5 Forests Today

1. While most of the forests have been cleared in southern Minnesota for farming, we still have \(16.3\) million acres of forested land, which is about \(\frac{1}{2}\) of the original total. The forest we still have in place cover about \(\text{one-third}\) of Minnesota’s land area.

2. Forest management today is increasingly focused on stewardship, multiple benefits and sustainability. Those who care for Minnesota’s forests recognize that (see page 29):
   a. This resource is to be \(\text{used}\) but not \(\text{abused}\).
   b. \(\text{Human}\) needs are to be balanced with other goals.
   c. Current demands must be compatible with our responsibility to \(\text{future generations}\).

3. Of today’s 16.3 million acres of forest land in Minnesota:
   \(36\)% is owned by private citizens
   \(7\)% is owned by private industry and corporations
   \(57\)% is the total owned by state, federal and county/municipal governments.

4. Check those items below that represent a benefit provided by today’s forests:
   \(\checkmark\) Timber
   \(\checkmark\) Nontimber products
   \(\checkmark\) Jobs
   \(\checkmark\) Wildlife habitat
   \(\checkmark\) Biological Diversity
   \(\checkmark\) Cultural resources
   \(\checkmark\) Water and Air Quality
   \(\checkmark\) Carbon Sequestration (absorbing carbon dioxide from the air and storing it in roots, stems, branches and foliage)
   \(\checkmark\) Recreation
   \(\checkmark\) Aesthetics (adding beauty to our surroundings)
   \(\checkmark\) Energy from Woody Biomass (burning trees, plants and associated residues to generate heat or electricity)

5. List the tree species from which the products listed below are made:

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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oaks</td>
<td>Furniture, cabinets, railroad ties</td>
<td>Firewood</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aspen</td>
<td>Pulp for paper (more pulp is made from this tree species than all others combined), oriented strand board (similar to plywood), paneling</td>
<td>Walking sticks</td>
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</table>
Chapter 6 Forests Tomorrow

1. Can you love the earth and cut trees too? Yes because trees are a renewable resource.

2. From the Forestry-related careers listed on pages 41 and 42, list the two that sound most interesting to you:
   1. _______ answers will vary _______________
   2. _______ answers will vary _______________