Title of Lesson Plan	Our Forest is Changing
Prepared By	Allison Webster
City and State	Grand Ledge, Michigan
Grade Level(s)	9, 10
Keywords (subjects covered)	Invasive species, canopy, fungus, insect, exit hole, Emerald Ash Borer, epicormic shoots, larvae, woodpecker, population, Beech Scale Disease, ecosystem, climax forest, opportunistic species, succession
Brief Description	Students will solve a problem or dilemma based on a story or information about an unhealthy population of trees.
Total Time Required	2-3 class periods (50-70 minutes per period)
Setting	Classroom, computer lab, outside (if an infected or normal tree exists)
Lesson Objectives/Goals	Students will be able to identify one invasive species affecting trees in the Great Lakes Region. Students will be able to explain how an invasive species affects a population.
Materials Needed	Computers, information resources…given to students from teacher, paper to write down information known, questions that need to be answered, and hypothesizes, tree identification books, pictures of trees (healthy and unhealthy)
Standards Addressed	B3.5 Populations-B3.5C Predict the consequences of an invading organism on the survival of other organisms.
Procedure	1. Students will be given an opening problem within a short story about a tree or population of trees. (Use any tree of interest.) 2. Students will then read the problem individually and then together as a class. 3. The teacher will have a prepared piece of paper on the board with What do we know? On the top. Students will then state all of the information that they know about the dilemma. The teacher or volunteer will write the information on the board. 4. The teacher will have prepared a piece of paper on the board with Learning Issues on the top. Students will then figure out what they are unsure of and state the issues out loud for the teacher or a student volunteer to write it on the board. 5. After the students make some predictions and try to solve the dilemma, the teacher will then hand the students Part II of the dilemma and a picture

	of the healthy and infected trees. (Students will have to use identification guides and the Internet to try to ID the tree species). (Use any other information about the same tree and disease for part II.) 6. Repeat 1-4 again with Part II. 7. After this the teacher and students will divide the learning issues among the students in the class. Depending on the issues, some learning issues will have more than one student working on finding the answer. 8. Now the students will be able to use the information from the book supplied to them, the Internet, or by looking at a picture of the destroyed trees. 9. This will end the first day of research. Continued research can be given as homework. 10. The next day the students will come back to class with information and the research process will either continue on or the students will present their information to the rest of the class. At this time, students may need more help. It would be great to have some hand outs with particular information about invasive species or tree diseases for the students to use as research. 11. At the end of day two, the students should have a good idea how to answer the problem. There should be a presentation of the new information learned and the answers to the learning issues. 12. At this point, new hypothesizes should begin to form. During this time, the teacher should ask the students periodically "Have we solved the dilemma?" Students should begin to catch on and hopefully, with the information presented the students should be able to fully solve the problem. 13. A question sheet should be then given to the students as an assessment. (Examples of questions: What type of tree is being infected? How does this tree fit into the ecosystem in this forest? Why is it changing and what is causing it to die? 14. Go over the assessment. 15. Give students another dilemma or give notes about invasive species and other tree diseases.
Assessment	A question sheet should be then given to the students, as

	an assessment. (Examples of questions: What type of tree is being infected? How does this tree fit into the ecosystem in this forest? Why is it changing and what is causing it to die? Students should do this on their own. The first 10-15 minutes should be completed without notes or information from the research. The next 10-15 minutes the students can use their notes and research.
Literature Cited/References	http://www.na.fs.fed.us/spfo/pubs/fidls/beechbark/fidl-beech.htm http://www.invasive.org/symposium/houston.html http://nrs.fs.fed.us/disturbance/invasive_species/
Forestry Tour Attended	2008 Lake States

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