

WHAT WILL THE FOREST DO?

Performance Standards 12B/11A/13A/13B.I

Students will apply the concepts, principles and processes of scientific inquiry to explain population growth and density factors in ecosystem change, stability and biodiversity.

- *Knowledge*: understand how cultivation and harvesting of timber affects the re-growth of trees.
- *Application*: research effects of different timber cultivation and harvesting techniques on the future growth of trees.
- *Communication*: compare most productive lumbering practices as they relate to environmental impact.

Procedures

1. ***In order to know and apply concepts that describe how living things interact with each other and with their environment (12B); the concepts, principles and process of scientific inquiry (11A); the accepted practices of science (13A); and concepts that describe the interaction between science, technology and society (13B)***, students should experience sufficient learning experiences to develop the following:
 - Formulate a scientific inquiry which can compare research about forestry cultivation techniques related to the interaction of resource acquisition, technological development and ecosystem impact or natural resource conservation and management issues.
 - Generate inquiry question(s) for the premise of the individual student investigation.
 - Preview pertinent sources of scientific research related to historic and current foundations for similar studies as primary reading sources.
 - Determine variables to compare between different timber cultivation and harvesting techniques.
 - Collect pertinent data from expert sources.
 - Evaluate research evidence and sources for bias or timeliness.
 - Use scientific technologies to collect; store; and retrieve, assimilate and communicate data, as applicable.
 - Prepare data tables, charts and visualizations about assigned technique.
 - Interpret and represent analysis of assigned technique.
 - Present findings about assigned technique for class comparisons.
 - Identify how scientific and commercial conclusions are open to modification as new data are collected.
 - Evaluate comparable inquiry investigations for consolidation or critique of findings.
 - Generate further questions or issues for consideration.

Note to teacher: This activity relates to knowledge associated with Standard 12B, while addressing Performance Descriptors for Stage I within Standard 11A. Applying scientific habits of mind in Standard 13A are foundational. Applying the societal implications of this scientific research addresses Performance Descriptors in Standard 13B. The construction trades are very dependent upon the timber industry to provide an economical source of building materials. Students seeking careers in the various aspects of building trades need to understand the renewable nature of this supply source and the importance of proper forest management to assure the long-term supply of building materials.

2. Have students review and study the assessment task and how the rubric will be used to evaluate their work.
3. Set the stage for this activity by discussing where we get our wood. Explain that wood is a renewable resource. By proper resource acquisition, conservation and management techniques, it will be renewed perpetually. Show students pictures of what happens when destructive timber harvesting techniques are used, available from http://www.lib.duke.edu/forest/Clearcuts_general_gallery/index.htm. The class should discuss what would be the deciding factors for the selection of cultivation or harvesting techniques before they start their individual research. These factors will be the frame for evaluation after the research is shared. Organize a classroom investigation that researches various ways that timber is cultivated or harvested. Individual or teams of students should consider information concerning: environmental effects, the amount of timber produced, ways to start new trees, what affects the growth of new timber, what possible side effects come from this type of harvesting, which harvesting technique produces new timber fastest, cost of harvesting and historic information about the technique used. Students will present their information making a case for the technique they researched. The class should form conclusions on which practice is best suited for the most efficient use of our resources, using the class-determined factors to rate each technique. Emphasize that each technique will be a mix of positive

and negative factors. Each student should record his/her choice of best forestry cultivation or harvesting technique, based on evidence presented.

4. Evaluate each student's work using the Science Rubric as follows, and add the scores to determine the performance level:
 - *Knowledge*: The foundational information about forest cultivation and harvesting is complete and accurate.
 - *Application*: The forestry research provides accurate and complete evidence on selected variables from different cultivation and/or harvesting techniques.
 - *Communication*: The group and individual comparisons and conclusions on the most productive practices and environmental impact were well organized, well detailed and based on scientific evidence.

Examples of Student Work

- [Meets](#)
- [Exceeds](#)

Time Requirements

- Two-to-three class periods for investigation orientation and initial research
- Three-to-five days for research and preparation for presentation
- One-to-two class periods for class presentations and wrap-up

Resources

- What Will the Forests Do? Research Guidelines
- Timber production:
 - http://www.amazonia.net/Topics/Timber_Production_Trade_Logging_Companies-34/index.html
 - http://www.coillte.ie/managing_our_forests/policies_plans/timber.htm
 - <http://www.rtp.srs.fs.fed.us/econ/pubs/scfra82.htm>
- Timber Harvesting Techniques
<http://www.plumcreek.com/environment/harvest.cfm>
- Science Rubric

WHAT WILL THE FORESTS DO? RESEARCH GUIDELINES

CULTIVATION OR HARVESTING TECHNIQUE

Which one? _____

Research the following kinds of ideas. Some may be more or less applicable to your assigned technique. You will need to present your findings, along with applicable graphs, charts or pictures, for comparison to other cultivation or harvesting techniques.

Explain the technique

General geographic considerations

Specific tree requirements

Impact factors (weather, species, pests, etc.)

Published productivity factors

Positive AND negative effects on the environment

Historical information about this technique

Recent modifications to the technique

After class presentations, explain your choice as the best cultivation or harvesting technique. Provide evidence for why you selected this technique based on the criteria that your class determined for choices.

SCIENCE RUBRIC

Exceeds - must receive no more than one 3 and the rest 4s in the other areas of the rubric.

Meets - may receive no more than one 2 and a combination of 3s and 4s in the other areas of the rubric.

Approaches - may receive no more than one 1 and a combination of 2s, 3s or 4s, in the other areas of the rubric.

Begins - must receive at least a 1 in all 3 areas of the rubric.

	KNOWLEDGE	APPLICATION	COMMUNICATION
	Knows and understands scientific terms, facts, concepts, principles, theories and methods.	Applies scientific knowledge, skills and methods to manipulate, analyze, synthesize, create and evaluate.	Communicates scientific knowledge and applications through writing, speech and visual displays.
4	<ul style="list-style-type: none"> • Descriptions of scientific terms, facts, concepts, principles, theories and methods are complete and correct. 	<ul style="list-style-type: none"> • Applications are thorough, appropriate and accurate. 	<ul style="list-style-type: none"> • Written, oral and/or visual communication is well organized and effective.
3	<ul style="list-style-type: none"> • Descriptions of scientific terms, facts, concepts, principles, theories and methods are mostly complete and correct. 	<ul style="list-style-type: none"> • Applications are mostly thorough, appropriate and accurate. 	<ul style="list-style-type: none"> • Most of the written, oral and/or visual communication is well organized and effective.
2	<ul style="list-style-type: none"> • Descriptions of scientific terms, facts, concepts, principles, theories and methods are somewhat complete and correct. 	<ul style="list-style-type: none"> • Applications are somewhat appropriate and accurate. 	<ul style="list-style-type: none"> • Some of the written, oral and/or visual communication is organized and effective.
1	<ul style="list-style-type: none"> • Descriptions of scientific terms, facts, concepts, principles, theories and methods are minimally present or correct. 	<ul style="list-style-type: none"> • Applications are minimally appropriate and accurate. 	<ul style="list-style-type: none"> • Little of the written, oral and/or visual communication is organized and effective.
0	<ul style="list-style-type: none"> • All descriptions of scientific terms, facts, concepts, principles, theories and methods are missing and/or incorrect. 	<ul style="list-style-type: none"> • All applications are missing and/or incorrect. 	<ul style="list-style-type: none"> • All of the written, oral or visual communication is missing and/or lacks organization.
Score			