Natural Resource Management Duties and Task List	Name: _____			
Legend				
1. Standard: Students will understand:				
1.1. Benchmark: Students will be able to				
FORESTRY				
1. Introduction to Forestry:				
1.1. Describe the history of Pennsylvania's forests				
1.2. Describe the varied and multiple-uses-of forests				
1.3. Identify-current issues and-policies in forest-management				
2. Safety:				
2.1. Identify and demonstrate the use of-personal safety-equipment				
2.2. Identify unsafe conditions at a logging site or in the forest				
2.3. Use fire extinguisher				
2.4. Use first aid kit				
2.5. Maintain equipment in safe working order				

3. Careers in Forestry:				
3.1. Examine career opportunities in forestry				
3.2. Identify-advance training and post-secondary education in forestry				
4. Economics of Forestry				
4.1. Describe the-role of forestry in the-local, state, national and-international economy.				
4.2. Describe the impact of local policies (e.g., noise, no-trucks, etc.) on forest economies				
5. Forest Ecology and Conservation:				
5.1. Describe basic concepts of forest ecology and conservation				
5.2. Describe sources of tree variability and diversity				
5.3. Describe the effects of temperature, moisture, soil, and solar radiation on tree growth				
5.4. Describe competition and successions role in forest ecology				
5.5. Describe basic-forest conservation policies and-practices				

6. Dendrology:				
6.1. List and describe the US forest types				
6.2. Identify trees and shrubs				
6.3. Identify range, tolerance and site requirements for major forest species				

7. Forest Measurement:				
7.1. Scale and grade logs				
7.2. Measure tree diameter and height				
7.3. Perform a timber cruise (inventory) and describe its purpose				
7.4. Determine a trees age and health				
7.5. Demonstrate surveying techniques				
7.6. Calculate elevation, slope, and acreage				
7.7. Interpret map scales and symbols				
8. Silviculture:				
8.1. Describe methods of planting trees				
8.2. Perform thinning and pruning techniques				
8.3. Describe various cutting methods as well as when and why they are appropriate				
8.4. Describe the methods used for natural and planted forest regeneration				
9. Harvesting:				
9.1. Demonstrate felling, limbing and bucking techniques				
9.2. Demonstrate safe loading and hauling practices				

10. Manufacturing Lumber:				
10.1. Sort logs by species and grade				
10.2. Saw logs for value and product specifications				
10.3. Measure, edge and trim lumber for grade and volume				
10.4. Demonstrate safe operation of a sawmill				
10.5. Describe the use of a kiln				
10.6. Plane, sort and sticker lumber				
10.7. List basic lumber sizes				
10.8. Compare manufacturing and marketing of hardwoods and soft woods				

11. Forest Products:				
11.1. Recognize and name the major forest products besides lumber and paper products (i.e. mushrooms, Christmas trees, herbs, honey bees, recreation)				
11.2. Describe species utilization				
12. Urban Forestry:				
12.1. Describe the benefits and roles of urban forestry				
12.2. Identify and select proper trees-and shrubs for urban setting				
12.3. Plant, fertilize and trim trees and shrubs				

12.4. Practice safe removal of limbs and trees				
12.5. Identify traits of hazardous trees and common problems of urban trees and shrubs				
LEADERSHIP AND CAREER DEVELOPMENT				
1. Fundamentals of Leadership and Career Development:				
1.1. Identify and describe leadership styles				
1.2. Identify the factors in developing effective leaders				
1.3. Identify traits of effective leaders				
2. Employability Skills:				
2.1. Identify and find career information and resources and use them -in career decision making				
2.2. Comp1ete a career portfolio including a resume, application, and interview for employment				
2.3. Understand the necessity of continuing education and lifelong learning				
3. Job Readiness and Retention Skills:				
3.1. Demonstrate the ability to dress appropriately for the workplace and task to be accomplished including appropriate safety ppe				
3.2. Participate successfully in teams and demonstrate congeniality and collegiality				
3.3. Demonstrate problem solving techniques				
3.4. Understand diversity and work-effectively with others from other cultures				

3.5. Demonstrate the ability to be punctual, honest, and responsible				
3.6. Work independently and be self motivated				
3.7. Demonstrate conflict resolution techniques				

4. Citizenship:				
4.1. Identify and describe various community based youth, civic and professional organizations				
4.2. Participate in a selected community based youth civic and professional organization				
4.3. Develop an understanding of the purpose, structure, and function of governmental units at all levels.				
5. The purpose structure and function of FFA:				
5.1. Identify the aims, purposes, structures of the FFA				
5.2. Explain FFA tradition and Principles				
5.3. Describe the historical development of the FFA				
6. Individual and Group Leadership:				
6.1. Demonstrate the ability to use parliamentary procedure in organizational business meetings				
6.2. Facilitate groups and build teams				
6.3. Conduct successful meetings				

7. Communication and Public Speaking:				
7.1. Demonstrate specific communication skills				
7.2. Demonstrate the use of emerging technologies as a tool for increasing effective communication				
8. Information Research Skills:				
8.1. Conduct extensive research on a selected topic using the internet				
8.2. Describe the process used for conducting surveys and studies				
NATURAL RESOURCES MANAGEMENT:				
1. Natural Resource Conservation and Preservation:				
1.1. Describe the history of conservation in the United States through the present time				
1.2. Identify renewable and non-renewable natural resources				
1.3. Demonstrate conservation and preservation practices				
1.4. Explain the relationships among organisms, habitats and ecosystems and the impact of human activities on these relationships				
1.5. Describe current issues and public concerns in natural resource conservation				

2. Safety:				

2.1. Demonstrate outdoor safety techniques				
2.2. Identify safe hazardous waste disposal techniques				
2.3. Demonstrate the safe use of natural resource tools				
3. Careers in Natural Resource Management:				
3.1. Examine career opportunities in natural resource management				
3.2. Identify advanced training and post-secondary education in natural resource management.				
3.3. Demonstrate technological awareness and computer competence as it relates to careers in natural resources				
4. Environmental Protection:				
4.1. Identify natural resources and how they are protected both voluntarily and by law				
4.2. Define and identify pollutants, toxins and safe environmental practices				
4.3. Understand waste management hierarchy of prevention, reuse, recycling and safe disposal				
4.4. Know the roles of conservation and preservation organizations				
4.5. Understand the effect of economics and social trends on the implementation of environmental protection				
5. Forests and Vegetated Areas:				
5.1. Describe riparian zones				
5.2. Identify non-consumptive uses of forests and vegetated areas				

5.3. Describe conservation practices for forests and vegetated areas				
6. Fish and Wildlife:				
6.1. Identify fish and wildlife found in Pennsylvania				
6.2. Explain and identify fish and wildlife management techniques				
6.3. Understand the impact of land use on fisheries				
6.4. Plan and install a habitat improvement project				
7. Soils and Soil Conservation:				
7.1. Describe the major soil characteristics and how they affect soil usage				
7.2. Define soil erosion and what causes soil erosion				
7.3. Explain how to control farm and non-farm soil erosion				
7.4. Describe soil health				

8. Water:				
8.1. Explain the hydrologic cycle				
8.2. Investigate water pollution and ways to control and prevent it				
8.3. Identify waste management practices and describe how they affect water quality				
8.4. Explain the importance of water use planning				

8.5. Examine water quantity use and trends				
9. Air:				
9.1. Identify sources of air pollution				
9.2. Analyze air pollution's affect on the environment				
9.3. Describe air quality improvement and pollution prevention practices				
10. Land Use:				
10.1. Identify the various types of land uses				
10.2. Describe land use planning and growth management methods				
10.3. Explain the history of land use in Pennsylvania				
10.4. Explain the effects of technology on land use in urban and rural settings				
10.5. Describe the various efforts to deal with the preservation of valuable agricultural land for its socioeconomic uses				
11. Energy and Minerals:				
11.1. Describe the energy industry				
11.2. Compare alternative energy sources				
11.3. Describe the usage of metals and minerals in today's society				
11.4. Describe the impacts of resource extraction				

12. Outdoor Recreational Systems:				
12.1. Identify and describe the federal, state and local-recreational systems/programs				
12.2. Analyze recreational uses and their impact on the environment				
12.3. Discuss competition for resources and the impact on private property rights and responsibilities				

13. Sustainability:				
13.1. Define sustainability				
13.2. Describe the concept of stewardship of natural resources				
13.3. Identify ethical issues in the sustainability of natural resources				
PLANT AND SOIL SCIENCE:				
1. Botany and Physiology:				
1.1. Describe the process of photosynthesis, respiration, translocation, and transpiration				
1.2. Identify cell structure, organization and function				
1.3. Identify plant structures and explain their functions				
1.4. Identify flower structure and describe the events in pollination				
1.5. Identify seeds and seed structures and explain their functions				

1.6. Identify elements essential for germination				
1.7. Explain the environmental factors that affect the growth and development of a plant				
2. Plant Reproduction:				
2.1. Demonstrate sexual and asexual plant propagation methods				
3. Plant Nutrition:				
3.1. Identify plant nutrient requirements				
3.2. Describe the nutrient cycle				
3.3. Describe the composition of commercial fertilizers and their use				
4. Managing Agricultural Soils:				
4.1. Identify and describe soil characteristics				
4.2. Analyze and interpret soil surveys				
4.3. Identify soil nutrients				
4.4. Conduct basic soil testing				
4.5. Interpret commercial soil test reports				
4.6. Identify physical limitations of soils using soil profiles				
4.7. Describe criteria for selecting fertilizers and other soil amendments				
4.8. Describe factors influencing fertilizer application				

4.9. Identify potential land use based on soil limitations				

5. Fruit and Vegetable Production:				
5.1. Identify kinds, varieties, and uses of fruits and vegetables				
5.2. Demonstrate knowledge of commercial seed bed preparation, planting, and spacing methods				
5.3. Describe the use of proper cultivation techniques and their scheduling				
5.4. Determine appropriate harvesting schedules, techniques and crop rotation				
5.5. Identity and control insects and diseases that affect fruits and vegetables				
5.6. Identify and describe the use of fruit and vegetable tools and equipment including the calibration of sprayers and spreaders				
5.8. Identify common fruit arid vegetable marketing methods				
6. Nursery Management and Production:				
6.1. Receive and handle nursery stock				
6.2. Maintain nursery stock (watering, pruning, fertilizing)				
6.3. Identify and control insects and diseases that affect nursery stock				
6.4. Prepare nursery stock for marketing				
6.5. Identify and describe the use of nursery tools and equipment including the calibration of sprayers and spreaders				

6.6. Propagate nursery stock				
POWER AND SYSTEMS TECHNOLOGY:				
1. Safety:				
1.1. Demonstrate positive safety attitudes and responsibilities				
1.2. Recognize and demonstrate safety rules and regulations				
1.3. Describe regulations, safety and consumer protection				
2. Metals Fabrication and Welding:				
2.1. Explain the principles of oxy-fuel and electric welding and cutting				
2.2. Select, adjust, and operate oxy-fuel equipment with and without filler rod				
2.3. Select and safely employ the appropriate electric welding apparatus and materials				
2.4. Demonstrate multiple types of welds meeting industry standards				

3. Small Engine Systems:				
3.1. Identify principles of small engine operation				
3.2. Demonstrate the use of measuring devices for small engines				
3.3. List the component parts of a small engine				

3.4. Disassemble and reassemble a small engine using all diagnostic tools				
3.5. Trouble shoot a small engine and return to working order				
3.6. Maintain a small engine				
3.7. Recondition a small engine				
4. Machinery and Equipment Systems:				
4.1. Review service schedules and conduct procedures				
4.2. Select, use and calibrate measuring and testing devices				
4.3. Perform disassembly and assembly procedures				
4.4. Demonstrate disposal and storage procedures				
4.5. Engage and operate machinery and power equipment				
4.6. Demonstrate the use of auxiliary machinery and equipment systems				
4.7. Conduct troubleshooting procedures				
5. Energy Systems:				
5.1. Identify the parts and functions of the specific energy systems of mechanical power, solar power, wind power, electrical power, and chemical power systems				
5.2. Perform energy system maintenance, testing and evaluation				
5.3. Discuss and explain the operating principles for energy systems				
5.4. Explain and-describe principles-of power transmission, heat transfer, evaporation, fluid movement, conductivity and conservation				

6. Structural Systems:				
6.1. Conduct a structure site evaluation				
6.2. Interpret plans and drawings				
6.3. Develop a list of materials and itemized bid list				
6.4. Determine structure codes and current regulations and prepare for inspections				
6.5. Layout a structure foundation, erect batter boards, frames or forms				
6.6. Identify and evaluate building construction materials, methods and styles				
6.7. Estimate-handling materials, cost and construction time				
6.8. Calculate ventilation, electric, water, heating-and cooling needs				
6.9. Calculate mix and finish concrete and mortar				
6.10. Design and construct trusses and rafters				
6.11. Demonstrate skills in the construction of an agricultural structure				

7. Environmental and Natural Resource Systems:				
7.1. Identify environmental problems in livestock, crop handling, processing, nursery and landscaping, aquaculture, forestry and agribusiness				
7.2. Read and interpret maps and global positioning systems including land use, conservation, soils, topographic, aerial and remote sensing, and geological surveys				
7.3. Read legal land descriptions and determine land areas				

7.4. Determine elevation, slope and grades				
7.5. Identify and assemble appropriate irrigation systems				
7.6. Identify and evaluate waste disposal systems				
7.7. Construct and assemble environmental and natural resource system equipment and structures				