

FORESTRY RULES

Revised 12/16/13

PURPOSE

The New Mexico FFA Forestry Career Development Event is designed to stimulate student interest, promote forestry instruction in the agricultural education curriculum, and to provide recognition for those who have demonstrated skills and competencies as a result of forestry instruction.

OBJECTIVES

In the Forestry CDE FFA members will be able to:

- Understand and use forestry terms
- Promote an understanding of the economic impact of forest environments and the forest industry to the American economy
- Recognize multiple-use and social opportunities in the forests
- Identify major species of trees of economic importance to New Mexico, the United States and internationally
- Utilize marketing management strategies
- Recognize safety practices in forestry management
- Recognize environmental and social factors affecting the management of forests
- Identify hand tools, equipment, and their use in forestry management
- Recognize and understand approved silvicultural practices in New Mexico and the United States.
- Identify forest disorders caused by pests, chemical or mechanical damage, or environmental factors

COMMON CORE REFERENCES

7th Grade:

CCSS.Math.Content.7.G.B.4 Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

8th Grade:

MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.*

9-10th Grade:

CCSS.Math.Content.HSG-MG.A.1 Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).*

11-12th Grade:

CCSS.ELA-Literacy.RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible

ORGANIZATION AND CONTENT

1. Refer to the General Rules.
2. The event will consist of 6 parts:
 - a. general knowledge exam
 - b. tree identification
 - c. equipment identification and chainsaw part identification
 - d. compass practicum
 - e. tree measurement practicum
 - f. insect/disease identification

Event Breakdown

- a. **The general knowledge exam** will be completed as an individual effort. Fifty objective-type multiple-choice questions will be selected from the New Mexico study materials. References are available on the state FFA website and are:

“New Mexico Best Management Practices”

“2006 Field Guide to Insects and Diseases of Arizona and New Mexico”

The Chainsaw Manual

The Equipment and Chainsaw Parts Identification

“Wildland Fire Suppression”

“Basic Land Navigation”

“Living with Fire”

Tree Identification Materials

Tree Height and Tree Diameter Materials

Study questions, quizzes and guides have been developed to assist the students in learning the materials. Scoring of the general knowledge exam will be as follows: Each question will be worth two points, for a total maximum score of 100 points.

- b. **Tree identification** will be completed as an individual effort. Participants will identify a maximum of 20 tree species selected from the given list. A maximum of two minutes will be allowed at each specimen with a total of forty minutes allowed for the practicum. There is no restriction on the number of duplicate mounts included in the event. References suggested:

The Tree Identification Study Guide

“Trees & Shrubs of New Mexico” by Jack L. Carter

“The Audubon Society Field Guide to North American Trees: Western Region” by E.E. Little.

Scoring of the plant identification portion of the event will be as follows: Two points for each correctly identified specimen. Specimens may not be touched. The total maximum score will be 40 points.

Species List:

1. White fir
2. Catclaw acacia
3. Rocky Mountain Maple
4. Boxelder
5. Thinleaf alder
6. Water birch
7. Pecan
8. Nettleleaf hackberry
9. Desert willow
10. Arizona cypress
11. Arizona ash
12. Arizona walnut
13. Oneseed juniper
14. Rocky Mountain juniper
15. Algerita
16. Blue Spruce
17. Pinyon pine
18. Eldarica pine
19. Ponderosa pine
20. Southwestern pine
21. Scots pine
22. Arizona sycamore
23. Rio Grande cottonwood
24. Quaking aspen
25. Honey mesquite
26. Screwbean mesquite
27. Douglas-fir
28. Gambel oak
29. Shrub live oak
30. New Mexico locust
31. Sandbar willow
32. Salt cedar

- c. **Equipment/Chainsaw Part identification** will be completed as an individual effort. Participants will identify a maximum of 20 items selected from the given list. A maximum of two minutes will be allowed at each specimen with a total of forty minutes allowed for the practicum.

Item list:

1. tree stick
2. diameter/loggers tape
3. increment borer
4. bark gauge
5. tree caliper
6. Pulaski forester axe
7. stereoscope
8. GPS receiver
9. soil sampler
10. wedge prism
11. relaskop
12. staff compass
13. hand compass
14. tree planting hoe or bar
15. log rule
16. planimeter
17. survey instrument
18. hip chain
19. plastic flagging
20. tree marking gun
21. clinometers
22. canthook
23. chainsaw
24. safety hard hat
25. chainsaw chaps
26. Safety glasses
27. altimeter
28. tally meter
29. fire rake
30. drip torch
31. fire weather kit
32. tally book
33. fire swatter
34. dot grid
35. backpack fire pump
36. plant press
37. flow/current meter
38. soil test kit
39. water sampler
40. densitometer
41. water test kit
42. pH meter
43. hand lens/field microscope
44. twist lock
45. chain catcher
46. front hand guard
47. oilmatic saw chain
48. chain tensioner
49. front handle
50. fuel pump
51. starter grip
52. decompression valve
53. guide bar
54. rear hand guard
55. spark plug boot
56. muffler
57. chain sprocket cover
58. clutch
59. master control lever
60. chain sprocket
61. adjusting wheel
62. handle of wingnut
63. rear handle
64. carburetor adjusting screws
65. fuel filler cap
66. anti-vibration system
67. chain brake
68. oil filler cap
69. bumper spike
70. throttle trigger interlock
71. guide bar nose
72. throttle trigger

Scoring of the equipment identification portion of the event will be as follows: Two points for each correctly identified item. Maximum score will be 40 points

d. **The compass practicum** will be completed as an individual effort. Participants will use hand compasses and pacing to simulate the determination of the property lines on a tract of timber. The compass course will have five marked points. Participants will start at any point and record the azimuth and distance to the next point. A calculator is permitted. Forty minutes will be allowed for the compass practicum.

Each chapter is responsible for bringing the following equipment to the event for team use:

1. compass
2. calculator

Electronic devices other than a compass and a calculator will not be permitted.

Scoring of the compass practicum will be as follows: Five points for each correct azimuth and five points for each correct distance. Partial credit will be given for each two degrees off of the correct azimuth and each foot off of the correct distance. Maximum score will be 50 points

- 5 points = 2 degrees or 1 foot of correct
- 4 points = 4 degrees or 2 feet of correct
- 3 points = 6 degrees or 3 feet of correct
- 2 points = 8 degrees or 4 feet of correct
- 1 point = 10 degrees or 5 feet of correct

(i.e. answer is 200 degrees and 55 feet)

- 5 points = 198, 199, 200, 201, 202 degrees, 54, 55, or 56 feet
- 4 points = 196, 197, 203, 204 degrees, 53 or 57 feet
- 3 points = 194, 195, 205, 206 degrees, 52 or 58 feet
- 2 points = 192, 193, 207, 208 degrees, 51 or 59 feet
- 1 point = 190, 191, 209, 210 degrees, 50 or 60 feet

e. **The tree measurement practicum** will be completed as a team effort. Using forest measuring tools (such as a scale stick, diameter tape, or clinometers) each team will measure pre-numbered trees and record the DBH (diameter breast height) computed to the nearest 1/10 of an inch, and the height of each tree from the base (at the ground) to the top (top of branches) computed to the nearest foot. The volume of the tree will be determined from the volume table provided using the height and the diameter of the tree. Always round down on the volume table (height and DBH) and if the tree is either too small or too large for the volume chart – the answer is 000. Forty minutes will be allowed for the tree measurement practicum. (Measuring instruments may ONLY be used to determine the DBH and tree height).

Each chapter is responsible for bringing the following equipment to the event for team use: (each team participating will need equipment)

1. D-tape
2. clinometers or tree stick

Scoring of the tree measurement event will be as follows: Four points for each correct tree height and four points for each correct DBH. Two points will be awarded for each correct volume. Partial credit will be given for each 1/10 off the correct DBH and each foot off the correct height. No partial credit is given for an incorrect volume. Maximum score will be 50 points.

4 points = 1/10 or 1 foot of correct

3 points = 2/10 or 2 feet of correct

2 points = 3/10 or 3 feet of correct

1 points = 4/10 or 4 feet of correct

(i.e. answer is DBH 12.5 and height 35 feet)

4 points = DBH 12.4, 12.5, 12.6; height 34, 35, or 36 feet

3 points = DBH 12.3, 12.7; height 33 or 37 feet

2 points = DBH 12.2, 12.8; height 32 or 38 feet

1 points = DBH 12.1, 12.9; height 31 or 39 feet

Standing Tree Board Foot Volumes —International 1/4 Inch								
	Number of 16-Foot Logs							
	½	1	1-1/2	2	2-1/2	3	3-1/2	4
DBH	8 feet	16 feet	24 feet	32 feet	40 feet	48 feet	56 feet	64 feet
12	30	60	80	100	120			
14	40	80	110	140	160	180		
16	60	100	150	180	210	250	280	310
18	70	140	190	240	280	320	360	400
20	90	170	240	300	350	400	450	500
22	110	210	290	360	430	490	560	610
24	130	250	350	430	510	590	660	740
26	160	300	410	510	600	700	790	880
28	190	350	480	600	700	810	920	
30	220	410	550	690	810	930		
32	220	410	550	690	810	930		
34	290	530	730	900				
36	330	600	820					
38	370	670	910					
40	420	740						
42	460	820						

f. **The insect and disease identification** will be completed as an individual event. Participants will identify a maximum of 20 specimens selected from the given list. A maximum of two minutes will be allowed at each specimen with a total of forty minutes allowed for the practicum. There is no restriction on the number of duplicate mounts included in the event. References suggested: “2006 Field Guide to Insects and Diseases of Arizona and New Mexico” published by the US Forest Service and the Bugwood Network, an online resource that can be found at www.bugwood.org.

Each chapter is responsible for bringing the following equipment to the event for individuals to use:

1. magnifying glasses

Scoring of the insect and disease identification portion of the event will be as follows: Two points for each correctly identified specimen. Specimens may not be touched. The total maximum score will be 40 points.

Species/disorder list:

- | | |
|---------------------------------|-----------------------------|
| 1. Western spruce budworm | 15. Wood borers – longhorn |
| 2. Douglas-fir tussock moth | 16. Pine tip moths |
| 3. Pine-feeding needleminers | 17. Carpenter ants |
| 4. New Mexico fir looper | 18. Termites |
| 5. Fall webworm | 19. Black leaf spot |
| 6. Western tent caterpillar | 20. Elytroderma needle cast |
| 7. Aphids | 21. Blue stain fungi |
| 8. cooley spruce gall adelgid | 22. Cryptosphaeria canker |
| 9. Pinyon needle scale | 23. White pine blister rust |
| 10. Pine needle scale | 24. Broom rust |
| 11. Bark beetles – dendroctonus | 25. Dwarf mistletoe |
| 12. Bark beetles – Ips | 26. True mistletoe |
| 13. Fir engraver | 27. Burls |
| 14. Wood borers – metallic | |

EQUIPMENT NEEDED

Each chapter is responsible for bringing the following equipment to the event for team use:

- a. D-tape
- b. clinometer or tree stick
- c. hand compass
- d. calculator
- e. magnifying glass

Chapters not bringing equipment may have to forfeit portions of the practicums.

SCORING OF THE EVENT

General knowledge exam	100
Tree identification	40
Chainsaw/Equipment identification	40
Insect and disease identification	40
Compass practicum	50
Tree measurement practicum	<u>50</u>
Total points possible	320

Forestry CDE Contest Information

The team event (tree measurement) should be completed before any other part of the contest.

The team members can elect to complete the team event without all of the team present. The team event answers will be given to the individual in charge of the event who will in turn give them to the missing team members.

Team members should split up between the individual events so that no two team members are in the same individual competition.

Specimens should not be touched during the contest.

If a team member should need to leave the contest to compete in another contest, they will leave their scantron with the individual in charge of the event.

Do not write on the test – place your answers on the scantron.

All scantrons will be left at the last event the individual completes. **Make sure** all answers are bubbled in!!! And that your **name and contestant number** are on the scantron.

Scantron instructions:

Tree Measurement Practicum –

“Timber cruising DBH & Height” section of the scantron: Put the DBH where it says Height and put the Height where it says DBH.

“Practicums” section of the scantron: Put the volume of the tree.

Compass Practicum –

“Compass Practicum” section of the scantron: Put the azimuth and distance for point 1 to point 2 in 1, put the azimuth and distance for point 2 to point 3 in 2, etc.

General Knowledge Exam –

“Exam” section of the scantron

Tree Identification Practicum –

“Tree Identification” section of the scantron

Equipment and Chainsaw Practicum –

“Equipment or Tool ID” section of the scantron

Insects and Diseases Practicum –

“Forest disorders” section of the scantron

Volume Table:

1. Always round down never up.
2. If the tree doesn't fit the table the answer is 000.

Standing Tree Board Foot Volumes —International 1/4 Inch								
	Number of 16-Foot Logs							
	1/2	1	1-1/2	2	2-1/2	3	3-1/2	4
DBH	8 feet	16 feet	24 feet	32 feet	40 Feet	48 feet	56 feet	64 feet
12	30	60	80	100	120			
14	40	80	110	140	160	180		
16	60	100	150	180	210	250	280	310
18	70	140	190	240	280	320	360	400
20	90	170	240	300	350	400	450	500
22	110	210	290	360	430	490	560	610
24	130	250	350	430	510	590	660	740
26	160	300	410	510	600	700	790	880
28	190	350	480	600	700	810	920	
30	220	410	550	690	810	930		
32	220	410	550	690	810	930		
34	290	530	730	900				
36	330	600	820					
38	370	670	910					
40	420	740						
42	460	820						

Tree species and Insect and Diseases List:

NM Forestry CDE			
Insects and Diseases List			Tree Species List
1	Western Spruce Budworm	1	White fir
2	Douglas-fir Tussock Moth	2	Catclaw acacia
3	Pine-feeding Needleminers	3	Rocky Mountain maple
4	New Mexico Fir Looper	4	Boxelder
5	Fall Webworm	5	Thinleaf alder
6	Western Tent Caterpillar	6	Water birch
7	Aphids	7	Pecan
8	Cooley Spruce Gall Adelgid	8	Netleaf hackberry
9	Pinyon Needle Scale	9	Desert willow
10	Pine Needle Scale	10	Arizona cypress
11	Bark Beetles - Dendroctonus	11	Arizona ash
12	Bark Beetles - Ips	12	Arizona walnut
13	Fir engraver	13	Oneseed juniper
14	Wood Borers - Metallic	14	Rocky Mountain juniper
15	Wood Borers - Longhorn	15	Algerita
16	Pine Tip Moths	16	Blue spruce
17	Carpenter Ants	17	Pinyon pine
18	Termites	18	Eldarica pine
19	Black Leaf Spot	19	Ponderosa pine
20	Elytroderma Needle Cast	20	Southwestern white pine
21	Blue Stain Fungi	21	Scots pine
22	Cryptosphaeria Canker	22	Arizona sycamore
23	White Pine Blister Rust	23	Rio Grande cottonwood
24	Broom Rust	24	Quaking aspen
25	Dwarf Mistletoe	25	Honey mesquite
26	True Mistletoe	26	Screwbean mesquite
27	Burls	27	Douglas-fir
		28	Gambel oak
		29	Shrub live oak
		30	New Mexico locust
		31	Sandbar willow
		32	Salt cedar

Equipment and chainsaw part list:

NM Forestry CDE					
Equipment and Chainsaw ID					
1	tree stick	26	safety glasses	51	starter grip
2	diameter/loggers tape	27	altimeter	52	decompression valve
3	increment borer	28	tally meter	53	guide bar
4	bark gauge	29	fire rake	54	rear hand guard
5	tree caliper	30	drip torch	55	spark plug boot
6	pulaski forester axe	31	fire weather kit	56	muffler
7	stereoscope	32	tally book	57	chain sprocket cover
8	GPS receiver	33	fire swatter	58	clutch
9	soil sampler	34	dot grid	59	master control lever
10	wedge prism	35	backpack fire pump	60	chain sprocket
11	relaskop	36	plant press	61	adjusting wheel
12	staff compass	37	flow/current meter	62	handle of wingnut
13	hand compass	38	soil test kit	63	rear handle
14	tree planting hoe or bar	39	water sampler	64	carburetor adjusting screws
15	log rule	40	densiometer	65	fuel filler cap
16	planimeter	41	water test kit	66	anti-vibration system
17	survey instrument (some type)	42	pH meter	67	chain brake
18	hip chain	43	hand lens/field microscope	68	oil filler cap
19	plastic flagging	44	twist lock	69	bumper spike
20	tree marking gun	45	chain catcher	70	throttle trigger interlock
21	clinometer	46	front hand guard	71	guide bar nose
22	canthook	47	oilmatic saw chain	72	throttle trigger
23	chainsaw	48	chain tensioner		
24	safety hard hat	49	front handle		
25	chainsaw chaps	50	fuel pump		