Minnesota FFA

Forestry Career Development Event

Refer to the Minnesota FFA Career and Leadership Events webpage on https://www.mnffa.org/cde for the most up-to-date career and leadership development handbook edition.

Purpose

The Minnesota FFA Forestry Career Development Event is designed to stimulate student interest and to promote the forestry industry as a career choice. It also provides recognition for those who have demonstrated skills and competencies resulting from forestry instruction in the agricultural education classroom.

Objectives

Students will be able to

- Understand and use forestry terms.
- Promote an understanding of the economic impact of the forest environment and the forest industry to the American economy.
- Recognize sustainability (multiple use) opportunities in the forests.
- Recognize environmental and social factors affecting the management of forests.
- Identify major species of trees of economic importance to the United States and internationally.
- Identify and properly use hand tools and equipment in forestry management.
- Recognize and understand approved silvicultural practices in the United States.
- Identify forest disorders.
- Take a forest inventory.
- Utilize marketing management strategies.
- Recognize safety practices in forest management.

Event Rules

- Four members will constitute a team. The top three individual scores will be counted towards the team score.
- Participants must come to the event prepared to work in adverse weather conditions. The event will be conducted regardless of the weather. Participants should have rain gear, warm clothes, and closed-toed shoes.
- Students must provide their own Biltmore stick, tape measure, compass, hand lens, and pencils.
- All other equipment including clipboards and calculators will be furnished for the event. Participants must use the tools and equipment provided.
- Participants must follow instructions from event staff for handling materials during the event. Any infraction of this rule will be sufficient to eliminate the team from the event.
- No phones or smart devices will be allowed during any portion of the event.
- Observers will not be permitted in the event area while the event is in progress.

Event Format

INDIVIDUAL ACTIVITIES

Written Exam (150 points)

- 50 questions of multiple choice and/or true-false questions (true-false questions not to exceed 25% of the total questions) at 3 points each will be selected from areas of the forestry industry reflected in the event objectives. This phase of the event will test the participant's knowledge and understanding of basic principles of forestry.
- Questions will focus primarily on the following areas. Land Measurement, Scaling Forest Products, Forest Health and Protection, Fire Prevention and Control, Invasive Species, Harvesting Process, Forest Regeneration Methods, Windbreak and Shelterbelt Design, Christmas Tree Production, Wood Properties and Usage, Ecosystem Concepts, and Career Opportunities.
- Each participant will be allowed a maximum of one hour to complete this phase of the event.

Tree Identification Practicum (150 points)

- 25 live specimens, pressed samples, photos, fresh leaf samples and/or standing trees, from the tree identification list will be displayed for participants to identify by common names. A number will designate each specimen.
- Each participant will be allowed 30 minutes to complete this phase of the event.

Wood Identification Practicum (50 points)

- 10 wood samples will be identified at 5 points each. Multiple choice options will be provided for each wood sample.
- All wood samples must be a sample that fits the following criteria. Samples should fit one of the following types.
    - Planed lumber
    - Rough-cut lumber
    - Firewood
    - Tree Cookie
- Each participant will be allowed 30 minutes to complete this phase of the event.

Equipment Identification Practicum (50 points)

- A maximum of 10 items from the equipment identification list will be displayed for participants to identify by technical names. Each item will be designated by a number.
- The equipment will be presented in one or more of the following forms:
    - Actual samples.
    - Pictures or slides.
    - Written description.
- Each participant will be allowed 30 minutes to complete this phase of the event

Tree Measurement — Timber Cruising for Board Volume Practicum (50 points)

- Each participant will measure ten pre-numbered trees for board foot volume.
- The participant must record the DBH (Diameter Breast Height) to the nearest one-inch class. Diameter should be rounded down to the nearest inch.
- The following minimum diameters and log length will be:

Minimum Saw Timber	
DBH	10 inches
Top diameter	8 inches DIB
Height	8 feet

- Tree heights should be measured from a 6-inch stump height to an estimated 8-inch top diameter for merchantable height. The merchantable height should be rounded down to the nearest ½ log.
- Merchantable height stops are estimated to the upper point on a tree where it becomes 8 inches in diameter or where a major fork in a tree stem occurs or where a limb has a diameter equal to ½ of the diameter of the tree at that point.
- Volume tables will be provided at the event.
- Each participant will be allowed 35 minutes to complete this phase.
- Ten points will be given for the correct DBH and ten points for the correct height. Thirty points will be given for the correct volume per acre. Five points will be deducted for each five percent deviation (plus or minus) from the correct measured volume.

Rotational Individual Practicums (50 points each)

Three additional practicums will occur each year based on the year of the state convention. Odd Year and Even Year practicums are listed below.

- **ODD YEAR PRACTICUMS**
  - Tree/Forest Disorder
  - Product Scaling
  - Chainsaw Operation & Maintenance
- **EVEN YEAR PRACTICUMS**
  - Compass Practicum
  - Map Interpretation
  - Forest Business Management Problem

Tree/Forest Disorders Practicum

Ten disorders from the Tree Disorders Identification List will be displayed for participants to identify by common names. The symptoms will be presented in one or more of the following forms:

- Actual sample.
- Pictures.
- Written description.
- Written case history.

Product Scaling

Students will measure forest products for volume in board feet or cords, depending on the application. Log rules will not be provided but can be used if students bring them. Students will need to bring tape measures for this portion of the event. Samples to measure will include the three following categories.

- Lumber Scaling
- Pulpwood Scaling
- Log Scaling

Chainsaw Operation and Maintenance Practicum

This practicum will consist of one or more of the parts listed below. Parts may utilize photos, video, demonstration, actual parts, written situations and/or problems. Multiple choice format. This is not an all-inclusive list.

- **Parts Identification:** Each participant will identify parts of a chainsaw.
- **Problem Solving:** The participant will troubleshoot operation and maintenance issues.
- **Safety:** Participants identify safety hazards, unsafe practices and/or safety equipment.

Compass Practicum

The participant will use a hand compass and pace to the nearest full foot to simulate the determination of the property lines on a tract of timber. The participant will start at any point and record the compass reading and distance to the next point.

Azimuth readings shall be recorded. Participants will record data for 10 points.

Partial credit will be given with a deduction of one point for each two degrees or two feet the participant is off the correct answer.

Map Interpretation Practicum

Participants will answer a maximum of 20 questions using a furnished United States Geological Survey topographic map. The participant should know legal description, recognize topographic map symbols, and understand the meaning of map symbols, size and location of 40 acres or more in a parcel. Multiple choice format.

Examples:

What is the legal description of the boxed area?

What is the item located at this point?

What is the acreage of the area enclosed?

In what section is the city of Marshall located?

What is the elevation at this point?

Legal descriptions will be written or described according to the public land survey system.

- Example: SE ¼ of NW ¼ of Section 3, T3N, R1E

Forest Business Management Practicum

- This section is designed to determine the participant's ability to apply economic principles and concepts of management to the decision-making process by actual problem analysis and to defend the decisions made. This *will* involve a model forest operation with possible calculation on profit/loss, cost of operation, taxes, depreciation, marketing product, stumpage cost, record keeping, etc. A maximum of twenty problems or questions will be used. Multiple choice format.

Event Tiebreakers

Team

Tiebreakers for teams will be determined by adding together the individual ranking of team members. The team with the lowest score will earn the tiebreak.

Individuals

1. Knowledge Exam
2. Tree Identification
3. Tree Measurement
4. Total Rotational Practicum Score

References

This list of references is not intended to be all-inclusive. Other sources may be utilized, and teachers are encouraged to make use of the very best instructional materials available. Use discretion when selecting website references by only using reputable, proven sites. The following list contains references that may prove helpful during event preparation. The most current edition of resources will be used. Past CDE materials and other resources are available on https://www.mnffa.org/cde.

GENERAL KNOWLEDGE EXAM

- Forests and Forestry. Rolfe et al., Interstate Publishers. 0-8134-3240-5
- Introduction to Forestry Science. Burton, Delmar Publications. 0-8273-8010-0
- Science of Forestry Management. Irwin. AAVIM. 0-8960-6383-6

TREE IDENTIFICATION

- Dendrology at Virginia Tech, https://dendro.cnre.vt.edu/dendrology/factsheets.cfm
- W. H. Harlow, E. S. Harrar, and F. M. White. Textbook of Dendrology, current edition. New York, NY: McGraw-Hill Book Company.
- Silvics of North America, Handbook #654, volume one and two, U.S. Forest Service, https://www.srs.fs.usda.gov/pubs/misc/ag_654/table_of_contents.htm

TREE MEASUREMENT

- https://www.americanforests.org/wp-content/uploads/2014/12/AF-Tree-Measuring-Guidelines_LR.pdf
- Measuring Woodland Timber
- https://www.extension.purdue.edu/extmedia/FNR/FNR-4.pdf

FOREST MANAGEMENT

- Forests and Forestry. Rolfe et al., Interstate Publishers. 0-8134-3240-5
- Introduction to Forestry Science. Burton, Delmar Publications. 0-8273-8010-0
- Science of Forestry Management. Irwin. AAVIM. 0-8960-6383-6
- One Less Thing—Lessons, https://www.onelessthing.net/collections/lesson-plans

EQUIPMENT IDENTIFICATION

- https://www.forestry-suppliers.com/
- https://www.forestryequipmentguide.com/

MAP INTERPRETATION

- The U.S. Department of Interior Geological Survey Topographic Map Information and Symbols Key, Map Distribution, U. S. Geological Survey. https://pubs.usgs.gov/gip/TopographicMapSymbols/topomapsymbols.pdf
- https://www.honolulu.hawaii.edu/instruct/natsci/geology/brill2/TopoMaps.pdf
- https://paleoind.sitehost.iu.edu/Resources/Guide%20to%20Topographic%20Maps.pdf
- https://training.nwcg.gov/pre-courses/s290/S-290%20Student%20CD/Map%20and%20Compass.pdf

COMPASS

- https://courses.washington.edu/esrm304a/lectures/LAB%201/RangerCompass_UserGuide.2000_2-up.pdf
- https://training.nwcg.gov/pre-courses/s290/S-290%20Student%20CD/Map%20and%20Compass.pdf

CHAINSAW PARTS AND IDENTIFICATION

- https://www.aces.edu/wp-content/uploads/2020/11/FOR-2084-ChainsawSafetyIMaintenance_111120aL-G.pdf
- https://www.ctahr.hawaii.edu/oc/freepubs/pdf/res-092.pdf
- https://www.stihl.com/p/media/download/uk-en/STIHL_Chain_Saw_Safety_Manual.pdf
- https://fingerlakestrail.org/FLTC/BOM/REF/TrailManagementTeam/Maintenance/CHAINSAW%20MAINTENANCE%20--HOWDENsaw%20maintenance%20file(1).pdf

FOREST PRODUCTS

- www.home-extension.co.uk/timber.pdf
- https://www.weyerhaeuser.com/woodproducts/
- https://www.octaneseating.com/types-of-wood-for-furniture
- https://www.columbiaforestproducts.com/resources/forestry/common-timber-resources/
- https://www.americanhardwood.org/en/american-hardwood
- https://woodidentification.net/softwood-species-descriptions/

FOREST BUSINESS MANAGEMENT

- Forests and Forestry. Rolfe et al., Interstate Publishers. 0-8134-3240-5
- Introduction to Forestry Science. Burton, Delmar Publications. 0-8273-8010-0
- Science of Forestry Management. Irwin. AAVIM. 0-8960-6383-6

Tree Identification List

Hardwoods

1. American Elm
2. Balsam Poplar
3. Basswood
4. Bigtooth Aspen
5. Black Ash
6. Black Cherry
7. Black Walnut
8. Boxelder
9. Buckthorn
10. Bur Oak
11. Butternut
12. Caragana
13. Cottonwood
14. Green Ash
15. Hackberry
16. Hickory
17. Honeylocust
18. Ironwood
19. Northern Pin Oak
20. Northern Red Oak
21. Paper Birch
22. Prickly Ash
23. Quaking Aspen
24. Red Maple
25. Russian Olive
26. Silver Maple
27. Slippery Elm
28. Sugar Maple
29. White Oak
30. Willow

Softwoods

31. Austrian Pine
32. Balsam Fir
33. Black Spruce
34. Colorado (Blue) Spruce
35. Douglas Fir
36. Eastern Hemlock
37. Eastern Redcedar
38. Eastern White Pine
39. Jack Pine
40. Northern White Cedar
41. Norway Spruce
42. Ponderosa Pine
43. Red (Norway) Pine
44. Scotch Pine
45. Tamarack (Eastern Larch)
46. White Spruce

Equipment Identification List

1. Aerial Photo
2. Angle Gauge (Cruz-All)
3. Backpack Fire Pump
4. Biltmore Stick (tree stick)
5. Bow Saw
6. Bulldozer
7. Canthook
8. Chainsaw
9. Chainsaw Chaps
10. Chipper/Grinder
11. Clinometer
12. Containerized Seedling Block
13. Cruising Vest
14. Data Recorder
15. Diameter Tape
16. Dot Grid
17. Drip Torch
18. Ear Protectors
19. Felling Wedge
20. Feller Buncher
21. Fiberglass Tape
22. Fire Rake
23. Fire Swatter (Flap)
24. Forwarder
25. Fire Weather Kit
26. GIS Map
27. GPS Receiver
28. Hand Compass
29. Hand Lens
30. Harvester/Processor
31. Hip Chain
32. Hookeroon
33. Increment Borer
34. Laser Rangefinder
35. Log Truck
36. Logger's Tape
37. Lopping Shears
38. Mattock
39. Peavy
40. Planimeter
41. Plant Press
42. Planting Hoe or Bar
43. Pruning Saw
44. Plastic Flagging
45. Pruning Shears
46. Pulaski-Forester Axe
47. Relaskop
48. Safety Glasses
49. Safety Hardhat
50. Shearing Knife
51. Skidder
52. Slasher
53. Soils Map
54. Stereoscope
55. Tally Book
56. Topographic Map
57. Tree Caliper
58. Tree Injector/Hypo Hatchet
59. Tree Marking Gun
60. Wedge Prism

Tree Disorders Identification List

1. Anthracnose
2. Bark damage from deer rub
3. Black Knot of Cherry
4. Bronze Birch Borer
5. Deer browse damage
6. Emerald Ash Borer
7. Forest Tent Caterpillar
8. Frost Crack
9. Gall Rust
10. Heart Rot
11. Hypoxylon Canker on Aspen
12. Insect (cynipid wasp) gall on Bur Oak
13. Japanese Beetle
14. Maple Leaf Galls
15. Oak Wilt
16. Pine Bark Beetle
17. Rhizosphaera Spruce Needlecast
18. Spongy Moth
19. Thousand Cankers of Walnut
20. White Pine Blister Rust
21. White Pine Weevil
22. Witches Broom

Wood Identification List

Identify ten wood samples from multiple choice questions at five points each for a total of 50 points. Samples will be drawn from commonly found native and non-native tree species from the following list. Contestants may handle/touch the samples. A hand lens and light may be used for this portion of the contest.

Hardwoods

1. Ash
2. Aspen
3. Basswood
4. Birch
5. Black Walnut
6. Butternut
7. Cherry
8. Cottonwood
9. Elm
10. Hackberry
11. Hickory
12. Northern Red Oak
13. Sugar Maple
14. White Oak

Softwoods

15. Douglas Fir
16. Eastern Redcedar
17. Northern White Cedar
18. Ponderosa Pine
19. Red (Norway) Pine
20. Spruce
21. Tamarack (Eastern Larch)
22. White Pine

Timber Cruising Volume Table

Scribner Rule by Number of 16 Foot Logs

Number of 16 Foot Logs						
DBH Inches	**1/2**	**1**	**1 1/2**	**2**	**2 1/2**	**3**
10	17	28	36	44	48	52
11	22	38	49	60	67	74
12	28	47	61	75	85	95
13	34	58	76	94	107	120
14	40	69	92	114	130	146
15	47	82	109	136	157	178
16	54	95	127	159	185	211
17	63	109	146	184	215	246
18	72	123	166	209	244	280
19	81	140	190	240	281	322
20	90	157	214	270	317	364
21	100	176	240	304	358	411
22	111	194	266	338	398	458
23	123	214	294	374	441	508
24	137	234	322	409	484	558
25	149	258	355	452	534	617
26	282	282	386	489	576	663
27	310	310	425	540	638	735
28	339	339	466	592	700	807
29	370	370	509	648	766	884
30	400	400	552	703	832	961

Bd Ft Volume Estimation Worksheet

Name: **Team Number:**

School:

Tree Number	DBH	Number of Logs	Volume
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10			
		TOTAL VOLUME	

Remember to record the DBH, Number of Logs and Total Volume on your Scan sheet.

Log Scaling Volume Table

Scribner Rule by Number of 16 Foot Logs

Name: **Team Number:**

Length of Log (In Feet)							
Small End Diameter (Inside Bark)	**8**	**10**	**12**	**14**	**16**	**18**	**20**
6	5	10	10	10	20	20	20
7	10	10	20	20	30	30	30
8	10	20	20	20	30	30	30
9	20	30	30	30	40	40	40
10	30	30	30	40	60	60	70
11	30	40	40	50	70	80	80
12	40	50	60	70	80	90	100
13	50	60	70	80	100	110	120
14	60	70	90	100	110	130	140
15	70	90	110	120	140	160	180
16	80	100	120	140	160	180	200
17	90	120	140	160	180	210	230
18	110	130	160	190	210	240	270
19	120	150	180	210	240	270	300
20	140	170	210	240	280	310	350
21	150	190	230	270	300	340	380
22	170	210	250	290	330	380	420
23	190	230	280	330	380	420	470
24	210	260	300	350	400	450	500
25	230	290	340	400	460	520	570
26	250	310	370	440	500	560	620
27	270	340	410	480	550	620	680
28	290	360	440	510	580	650	730
29	310	380	460	530	610	680	760
30	330	410	490	570	660	740	820
31	360	440	530	620	710	800	890
32	370	460	550	640	740	830	920
33	390	490	590	690	780	880	980
34	400	500	600	700	800	900	1000

Compass Course Tally Sheet

Name: **Team Number:**

School:

Points	Azimuth (Degrees)	Score (Judges Only)	Distance (Feet)	Score (Judges Only)
Pt 1 to Pt 2				
Pt 2 to Pt 3				
Pt 3 to Pt 4				
Pt 4 to Pt 5				
Pt 5 to Pt 6				
Pt 6 to Pt 7				
Pt 7 to Pt 8				
Pt 8 to Pt 9				
Pt 9 to Pt 10				
Pt 10 to Pt 1				
Judges Subtotal				
			TOTAL SCORE (Out of 50)	

Product Scaling Tally Sheet

Name: **Team Number:**

Log Scaling

Record the scaling diameter, scaling length, and board foot volume for each log (give the board footage of each log). Do not deduct for defects.

Log Diameter	Scaling Length	Scaling Content	Board Foot Number
1	_____	_____	_____
2	_____	_____	_____
3	_____	_____	_____
4	_____	_____	_____

Pulpwood Scaling

Calculate and record the volume in cords to the nearest 1/10 cord of the simulated truck loads and/or piles of pulpwood. Assume a length of 8 feet.

Load/Pile Number	Cords (to the nearest 1/10 cord)
1.	_____
2.	_____
3.	_____
4.	_____

Lumber Scaling

Record the nominal (not actual) thickness, width, and length for each sample. Odd foot lengths are permitted. Calculate and record the number of board feet contained in each sample. Round board foot values to the nearest 1/10 board foot.

Sample (inches)	Thickness (inches)	Width (feet)	Length (Feet)	Board No.
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____