

# FORESTRY

The Forestry Career Development Event (CDE) requires students to demonstrate their skills in diagnosing forest disorders, managing forests and forest inventory and applying approved silviculture practices. Participation in the event offers students experience relevant to a career choice in forestry and natural resources.

Skills learned from this event range from forestry equipment identification to calculating a forest business management problem and prepare students for a variety of careers in forestry and natural resources.

## **RULES AND REGULATIONS**

1. A chartered FFA chapter may enter two teams in the Forestry Event, with one team designated as the official team. A team may consist of 5 eligible members. The score of the 3 high individuals will be used to determine the team score. Anytime there are 2 members of the same team in any one practicum/station, they will not ever be allowed to meet together or communicate during the event. There will be no communication between any competitors during the events. Any infraction of this rule will be sufficient to eliminate the contestant from the event.
2. Contestants will not be required to wear FFA official dress during any portion of the event.
3. The winning team in this CDE will be eligible to represent the state in the National Forestry Event held at the time of the National FFA Convention
4. The CDE will be made up of 7 events: a written test, map reading and math problem, tree identification, tool identification, compass and pacing, cruising, and timber stand improvement. Students will move through the events on an 40 minute schedule. There will be 5 minutes allowed for contestants to move between the events, and up to 5 minutes for the judges to review the rules.
5. All contestants are expected to be prompt at their stations throughout the CDE. No provision will be made for tardiness, and will most certainly cause late contestants to lose CDE points.
6. Contestants will be assigned to a "group leader" who will escort them from event to event. They are expected to stay with their group leader during these movements.
7. Given the time of the year, all contestants should be prepared for adverse weather. The CDE will go on despite the weather. They should have rain gear, warm clothes, and adequate footwear.
8. Contestants will provide their own clipboards, pencils, and calculators (non-programmable). Team coaches should provide their teams with biltmore sticks, clinometers and diameter/loggers tape for the cruising portion of the CDE, as well as hand compasses for the compass and pacing course.

## 9. SPECIFIC EVENT RULES

### **General Forestry Knowledge (100 points)**

Fifty (50) objective type multiple choice questions will be selected, representing various areas of the forest industry. Questions will come from the last three years of national tests. This phase of the CDE will test the contestant's knowledge and understanding of basic principles of forestry.

Scoring: Each answer has a value of 2 points for a total maximum score of 100 points. Contestants will mark the appropriate answer on an Answer Sheet.

### **Math Problem (25 points)**

One (1) math problem questions be will be selected

Scoring: Each answer has a value of 2 points

### **Map Reading (50 points)**

Ten (10) Map Reading questions be will be selected

Scoring: Each answer has a value of 2 points for a total maximum score of 100 points.

### **Forest Plant Identification (120 Points)**

Thirty (30) specimens from the Tree ID list will be displayed for contestants to identify by common names. Each specimen will be designated by a number. Contestants will be allowed to touch and smell the specimens, but

they will not be allowed to mutilate them.

Scoring: Four (4) points will be given for each specimen that is correctly identified; for a total maximum of 120 points.

### **Equipment Identification (120 points)**

Thirty (30) pieces of equipment from the equipment list will be displayed for contestants to identify by technical names. Each piece of equipment will be designated by a number. Contestants will not handle the exhibits. If a contestant is found handling the exhibits, they will be disqualified from this event.

Scoring: Four (4) points will be given for each piece of equipment identified correctly for a total of 120 points. All answers must be correct. No partial credit will be given.

### **Timber cruising for Board Foot Volume (100 points)**

Each contestant will measure five pre-numbered trees on a fractional acre PLOT for board foot volume. For each tree, the contestant must record the DBH (Diameter at Breast Height), and the merchantable height to a diameter of 8 inches. Diameters will be taken with the Biltmore stick scale or diameter tape, and ODD numbered inches will be rounded down. Height will be taken with the Merrit Hypsometer, clinometer, and will be rounded to the nearest 1/2 Log (based on a 16' Log). Contestants must then calculate both the PLOT VOLUME, as well as the VOLUME PER ACRE. The fractional acre size will be given at the CDE. A board foot table will also be issued at the CDE.

Scoring: Five (5) points will be allowed for the correct DBH, 5 points for the correct height, and 5 points for the correct tree volume. Fifteen (15) points will be given for the correct PLOT VOLUME; 10 points will be given for the correct VOLUME PER ACRE. Two (2) points will be deducted for each 5 percent (+/-) from the correct measured volume.

### **Forest Management Evaluation - Timber Stand Improvement (TSI) (100 points)**

Trees selected and designated for use in this part of the CDE may be all of one species or a mixture of species. An area will be selected and identified by ribbons, paint, rope, etc. It will contain 25 trees that will represent a timber stand that needs thinning or some TSI work. The trees will be flagged and numbered 1 to 25. If it happens that an area selected and marked off has a few more than 25 trees, the trees not needed for this phase will not be flagged. Students will be given a management plan or scenario for TSI.

All trees, with the exception of any unflagged trees, in the selected area will be considered as a forest management site, and each tree will be scored by the contestants using one of the following options:

- a. Cut - Thin out; cut and harvest the tree.
- b. Leave - Tree should remain for a good sound reason.
- c. Deadened - Undesirable tree, not merchantable, or beneficial to wildlife, should be "deadened" or cut down and left in woods.

Scoring: Four (4) points will be allowed for each correct decision up to a maximum total of 100 points.

### **Compass Orienteering Practicum (100 points)**

The contestant will use a hand compass and pacing to simulate the determination of property lines on a tract of timber. The compass course will have 5 marked points. The student will start at any point and record the compass reading and distance to the next point until they have completed all 5 stations.

Scoring: A total of 100 points are possible. Twenty (20) points for each correct numbered site. Ten (10) points for the correct bearing or azimuth, and 10 points for the correct distance. Each "leg" is scored individually. Partial credit will be given with a deduction of 1 point for each degree or foot the contestant is off the correct answer, but only up to 10 points for each leg.

### **Hosting:**

Five station rotation to include:

- Station 1 – TSI
- Station 2 – Cruising
- Station 3 – Plant ID & Tool ID
- Station 4 – Compass & Business Math
- Station 5 – Test & Map Reading

These should be 40 Minute rotations with 5 minutes for changing stations.

## Oregon FFA Forest Plant ID List

1. Bigleaf Maple
2. Black Cottonwood
3. Black Locust
4. Bracken Fern
5. California Black Oak
6. California Hazel
7. Canyon Live Oak
8. Cascara Buckthorn
9. Ceanothis
10. Douglas-fir
11. Dwarf Oregon Grape
12. Elder (Pacific, red, blueberry)
13. Engelmann/Sitka spruce
14. Evergreen Blackberry
15. Evergreen Huckleberry
16. Giant Sequoia
17. Golden Chinkapin
18. Hawthorn
19. Himalaya Blackberry
20. Incense Cedar
21. Jeffery Pine
22. Knobcone Pine
23. Lodgepole Pine
24. Manzanita
25. Mountain Hemlock
26. Mountain Mahogany
27. Ninebark
28. Noble Fir
29. Ocean Spray
30. Oregon Ash
31. Oregon Crab Apple
32. Oregon-Myrtle
33. Oregon White Oak
34. Pacific Dogwood
35. Pacific Madrone
36. Pacific Silver Fir
37. Pacific Yew
38. Ponderosa Pine
39. Port-Orford-Cedar
40. Quaking Aspen
41. Red Alder
42. Red Huckleberry
43. Redwood
44. Rhododendron
45. Salal
46. Salmonberry
47. Scotch Broom
48. Sugar Pine
49. Sword Fern
50. Tall Oregon Grape
51. Tan Oak
52. Thimble Berry
53. Vine Maple
54. Western Hemlock
55. Western Larch
56. Western Juniper
57. Western Redcedar
58. Western White Pine
59. White Fir/Grand Fir
60. Willow

***Resource: Trees to Know in Oregon and Shrubs to Know in the Pacific Northwest by Ed Jensen***

Name: \_\_\_\_\_

Chapter: \_\_\_\_\_

A/B Team: \_\_\_\_\_

Forestry Plant Identification

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## Oregon FFA Forestry Tool ID

1	anemometer	45	hazel hoe
2	azimuth Silva compass	46	head lamp
3	back pack pump	47	hip canteen
4	bark gauge	48	hip chain
5	Biltmore stick	49	increment borer
6	brush hook	50	increment hammer
7	block	51	Jacob's staff
8	bull hook	52	laser level
9	bulldozer	53	log branding hammer
10	butt rigging	54	log wrapper
11	cable cutter	55	logger's tape
12	calk boots	56	mainline
13	cant hook	57	marlin spike
14	chain binder	58	McLeod
15	chain saw	59	molle
16	chain saw file guide	60	mop up wand
17	chipper chain	61	peavy
18	chisel chain	62	prism
19	chisel file	63	processor
20	climber's safety belt climbing spurs (tree of pole)	64	Pulaski range finder / Forestry laser
21	clinometer	65	relaskop
22	complete choker	66	round file
23	cruiser's axe	67	safety chaps
24	diameter tape	68	scale stick
25	double bit swamping axe	69	scrench
26	drip torch	70	shackle (pin or screw)
27	Dwyer wind meter	71	sling psychrometer
28	ear plugs	72	spanner wrench
29	Faller's axe	73	splitting maul
30	felling/bucking wedge	74	stereoscope
31	fire pump	75	strap
32	first aid kit	76	Strawline/haywire
33	flagging foot valve w/ suction screen	77	suction hose
34	forester nozzle	78	tatum
35	forestry fire hose	79	tongs
36	Feller buncher	80	transit
37	fuel sticks	81	Tree harvester
38	fusee	82	tree marking gun
39	gated wye	83	tree planting hoe
40	global positioning system	84	yarder
41	hard hat		
42	haulback		

Name: \_\_\_\_\_

Chapter: \_\_\_\_\_

A/B Team: \_\_\_\_\_

Forestry Tool Identification

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**OREGON FFA**  
**STATE FORESTRY CDE**  
 COMPASS and PACING

Name \_\_\_\_\_

School \_\_\_\_\_

Team \_\_\_\_\_

COURSE LEG	AZIMUTH (degrees)	DISTANCE (feet)
1 -----> 2		
2 -----> 3		
3 -----> 4		
4 -----> 5		
5 -----> 1		

**Declination set on 20E.** Give Pacing - Round to nearest foot: 95.6 = 96 feet;  
 Azimuth to nearest degree. 95.4 = 95 feet

Aim compass at black dot below #.

# FFA State Forestry Contest-Timber Cruising

Test Trees: Five trees with orange flagging. Tree number on flagging  
 Plot Size: 1/10 Acre

**Instructions:**

- Measure diameter at breast height (DBH) with a loggers tape or diameter tape. Use this to calculate the 2" diameter class and record.
- Measure total height with a clinometer and record.
- Using 20" rule, calculate merchantable height and record.
- From Merchantable Height, calculate the number of 16-foot logs to the nearest ½ log and record.
- Using your volume table, find the volume for the 2" diameter class and # of 16-foot logs. For ½ logs, you will have to calculate the volume.
- Total up your volumes to determine plot volume and record.
- Using the appropriate expansion factor based on plot size, determine volume per acre and record.

<b>Tree No.</b>	<b>DBH (Inches, even number)</b>	<b>TOTAL HEIGHT (FT.)*</b>	<b>MERCH. HEIGHT (FT.)*</b>	<b># OF 16' LOGS (Nearest ½ log)</b>	<b>VOLUME (Board Feet)</b>
<b>1</b>					
<b>2</b>					
<b>3</b>					
<b>4</b>					
<b>5</b>					

Total Board Foot Plot Volume: \_\_\_\_\_

Total Board Foot Volume/Acre: \_\_\_\_\_

(\*) Do not grade these columns



DBH Inches	1	2	3	4	5	6	7	8	9	10	11
10											
12	4	7	11								
14	6	9	14	19							
16	9	12	18	24	30						
18		14	22	30	37						
20		17	27	36	45	55					
22			32	44	55	66					
24			40	54	67	81					
26			48	64	80	97					
28				76	95	114	133	152	172		
30				88	110	133	155	178	200		
32				102	127	153	178	204	230		
34				116	145	174	204	233	262		
36				131	164	197	230	264	297		
38				147	184	222	259	296	334		
40				164	206	247	289	330	372		
42					228	274	321	367	413		
44					252	303	354	405	456		
46					277	333	389	445	501	557	
48					303	364	425	486	548	609	
50					330	397	463	530	597	664	
52					358	431	503	576	648	720	
54					388	466	545	623	701	780	859
56					418	503	588	672	757	841	926
58					448	538	629	719	810	900	991
60					483	581	678	776	874	972	1070
62						622	726	831	936	1040	1145
64						664	776	888	999	1111	1223
66						708	827	946	1065	1184	1304
68						753	880	1006	1133	1260	1387
70						800	934	1069	1203	1338	1474
72						848	990	1133	1275	1418	1561
74						897	1048	1199	1350	1500	1652
76						948	1107	1266	1426	1585	1745
78						1000	1168	1336	1504	1673	1841
80						1053	1230	1408	1585	1762	1940
82						1108	1295	1481	1668	1854	2041
84						1164	1360	1556	1752	1948	2144
86						1222	1428	1633	1839	2044	2251
88						1281	1497	1712	1928	2143	2359
90						1342	1670	1793	2019	2245	2471
DBH Inches	1	2	3	4	5	6	7	8	9	10	11

Name: \_\_\_\_\_

Chapter: \_\_\_\_\_

A/B Team: \_\_\_\_\_

Knowledge Test

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Business Math

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Name: \_\_\_\_\_

Chapter: \_\_\_\_\_

A/B Team: \_\_\_\_\_

Maps

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Name: \_\_\_\_\_

Chapter: \_\_\_\_\_

A/B Team: \_\_\_\_\_

### Timber Stand Improvement

#### Management Objectives:

*There will be some scenario for the management objective of the stand provided. This will generally include stand information, plot size, and desired leave TREE PER ACRE.*

#### Unknown:

1. Square feet spacing between leave trees \_\_\_\_\_ x \_\_\_\_\_
2. Number of Leave Trees per Plot \_\_\_\_\_ - \_\_\_\_\_

**Circle the correct answer for each numbered tree.**

**C= Cut**

**L=Leave**

**D= Deadened (Wildlife or Species Diversity Needs)**

- |          |           |           |           |           |
|----------|-----------|-----------|-----------|-----------|
| 1. C L D | 6. C L D  | 11. C L D | 16. C L D | 21. C L D |
| 2. C L D | 7. C L D  | 12. C L D | 17. C L D | 22. C L D |
| 3. C L D | 8. C L D  | 13. C L D | 18. C L D | 23. C L D |
| 4. C L D | 9. C L D  | 14. C L D | 19. C L D | 24. C L D |
| 5. C L D | 10. C L D | 15. C L D | 20. C L D | 25. C L D |

## **Step by step guide for timber cruising:**

*This is a recommended teaching guide - will not be provided at COE*

1. Measure the DBH (diameter breast height) on the uphill side at 4.5 feet
2. Round DBH down to the nearest even number
3. Measure out 100 feet away from the tree
4. Using your clinometer measure the top of the tree (%side)
5. Using your clinometer measure the bottom of the tree (% side)
6. Subtract the bottom from the top to get the total height of the tree
7. To find merchantable height:
  - a. If the DBH was 20 inches or greater, subtract 20 feet from your height
- Or
- b. If the DBH was less then 20 inches, subtract 15 feet from your height
8. Divide your final merchantable height by 16 to determine number of logs (always round down to the nearest half log)
9. Use scribner decimal table to determine total board feet
10. Multiply final volume by 10