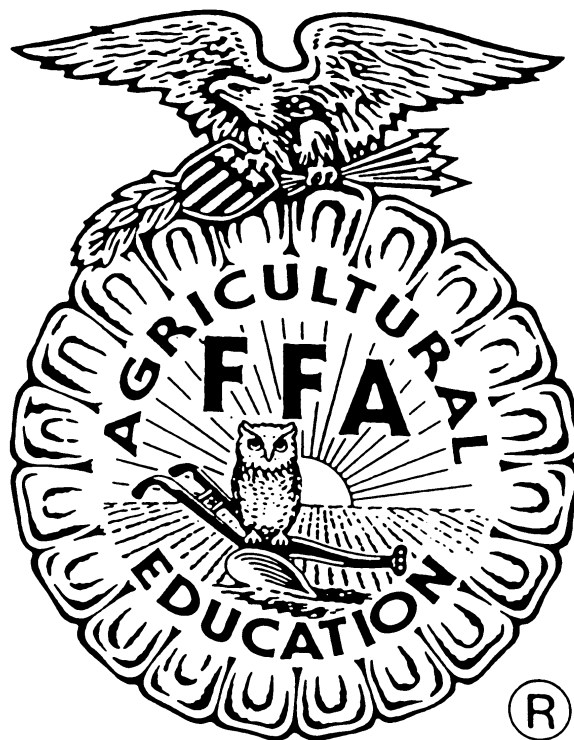


***SMALL ENGINES  
CAREER DEVELOPMENT EVENT***

*RULES AND REGULATIONS*

*TEAM COMPETITION*



***ALABAMA FFA ASSOCIATION***

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Alabama State Department of Education, Philip C. Cleveland, Ed.D.,  
Interim State Superintendent of Education

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**Revised August 2016**

# SMALL ENGINES CAREER DEVELOPMENT EVENT

## PURPOSE

This event is designed to provide students of Agriscience Education and members of the FFA an opportunity to compete and demonstrate their skills, abilities, and competencies in small engines.

## ELIGIBILITY AND REGULATIONS

1. Only district eliminations will be held prior to the state finals.
2. The team will consist of a maximum of four members. The team's total score will be based on the sum of the points earned by the three highest scoring participants on the team.
3. The top four place winners in the North, Central and South Districts are eligible for the state finals.
4. Competitors must enter their name on the scorecard or they will receive a score of zero. Judges will not attempt to figure out who the card belongs to.
5. If a cell phone is seen or heard in the possession of a competitor, that individual student will be disqualified from competition and receive a score of zero.

## INSTRUCTIONAL AREA

Each participant will compete in all phases of the event.

## DISTRICT EVENT

1. The teams competing in the district events will be composed of a maximum of four members. The three highest scorers will make up the team.
2. Event will consist of two phases and will be conducted by qualified personnel.  
  
Written Examination - This phase will consist of 75 multiple choice questions. Students may use a calculator if they wish. [One (1) point per question, for a possible 75 points.]  
  
Problem Solving - This phase will consist of identifying materials or solving problems. Each participant will solve 25 problems. Students may use a calculator if they wish. [Three (3) points per problem, for a possible 75 points.]
3. The participants will have 80 minutes in which to complete the two phases of the event.
4. District awards for the Small Engines Event will be the same as other team events.
5. In the event of a tie, the team with the highest combined score in the problem-solving phase will be placed highest.

## SCORING (District)

The following is an outline of the scoring for each individual team member.

1. Written Examination (District)	75 questions 1 point per question - 75
2. Problem Solving (District)	25 questions 3 points per problem - 75
-----	
TOTAL	150

The three highest individual scores will be added together for the total team score.

## STATE EVENT

1. The state event will be held during the State FFA Convention.
2. State Finals will consist of three phases:  
Written Examination -- Structured same as district.  
Problem Solving -- Structured same as district.  
Mechanics Skills -- This phase will consist of the completion of specified manipulative activities. Each participant will have 60 minutes in which to complete the hands-on shop activities.
3. All individual safety equipment will be furnished by the participant for the state event.
4. The contest superintendent will provide a list of necessary tools and equipment for qualifying teams prior to the state contest.
5. In the event of a tie, the team with the highest combined score in the skills phase will be placed highest. If this does not break the tie, the highest combined team score in skills and problem-solving phases will be the winner.

## SCORING (State)

The following is an outline of the scoring for each individual team member.

1. Written Examination (State)	75 questions 1 point per question - 75
2. Problem Solving (State)	25 questions 3 points per problem - 75
3. Mechanics Skills (State) Four(4) Skills	25 points per activity - 100
	-----
	TOTAL 250

The three individual scores will be added together for the total team score.

## STATE AWARDS/SPONSOR(S):

Refer to Alabama FFA Contests and Awards Booklet at:  
[http://www.alabamaffa.org/forms\\_applications.htm](http://www.alabamaffa.org/forms_applications.htm)

## SUBJECT MATTER CONTENT

The following is a list of the subject matter, along with specific skills, abilities, and understandings, and suggested references. References listed are suggested guides for study in preparation for the event. Examination questions and problem-solving activities will be selected from the references listed.

## SKILLS, ABILITIES, AND UNDERSTANDINGS

Small Engines Tools - identification and use

Principles of engine operation - two cycle

Principles of engine operation - four cycle

Identification and function of engine parts

## **Maintenance and repair of small gasoline engines**

- 1. Check flywheel magneto for proper operation with tester**
- 2. Remove and check flywheel**
- 3. Check and adjust armature air gap**
- 4. Install flywheel**
- 5. Service air cleaner**
- 6. Use and interpret specification charts and repair manuals**
- 7. Use parts manual**
- 8. Repair float-type carburetor**
- 9. Repair diaphragm-type carburetor**
- 10. Adjust carburetors**
- 11. Adjust chain saw or two-cycle carburetor**
- 12. Adjust governor**
- 13. Check valve-tappet clearance**
- 14. Remove and inspect valves**
- 15. Grind (reface) valves**
- 16. Grind (reface) valve seats**
- 17. Adjust valve-tappet clearance**
- 18. Install cylinder head**
- 19. Check reed valve for proper operation**
- 20. Remove and replace reed valve assembly**
- 21. Check breather**
- 22. Remove piston, rings, and connecting rod**
- 23. Check rings for wear**

24. Install rings
25. Inspect connecting rod
26. Install piston and connecting rod
27. Use torque wrench
28. Measure bore with dial caliper, inside micrometer, and telescoping gauge
29. Measure crankshaft for wear with dial caliper and micrometer
30. Install crankshaft and cam gear
31. Select fuel for two- and four-cycle engines
32. Select correct oil for small engine
33. Select and adjust spark plug
34. Trouble shoot two-cycle engine
35. Trouble shoot four-cycle engine
36. Interpret Briggs & Stratton numerical model number system
37. Repair rope-rewind starter
38. General engine repair and adjustment

## **REFERENCES**

1. Advanced Shop Guide for Vo-Ag Students, State Vo-Ag Office
2. Small Engines, Radcliff, American Technical Publishers
3. General Theories of Operation, Briggs and Stratton
4. Service and Repair Instructions, Briggs and Stratton
5. Torque and Torque Wrenches, Hobar Publications
6. Understanding Horsepower, AAVIM
7. Micrometer, Calipers and Gages, Hobar Publications
8. Small Gasoline Engines Service Manual, Technical Publications, Inc.

- 9. Care and Operation of Small Gasoline Engines, AAVIM**
- 10. Tecumseh Mechanics Manual, Four-Cycle Engine Manual, 3-10 h.p.**
- 11. Tecumseh Mechanics Manual, Two-Cycle Part #692508**



**SMALL ENGINES  
CAREER DEVELOPMENT EVENT**

CHAPTER \_\_\_\_\_

Participant	Participant Number	Event Phase	Participant Score	Participant Total
Name of Participant # 1		Written Exam (75 points)		
		Problem Solving (75 points)		
		<b>Participant # 1's Total</b> (Maximum score possible is 150 points.)		
Name of Participant # 2		Written Exam (75 points)		
		Problem Solving (75 points)		
		<b>Participant # 2's Total</b> (Maximum score possible is 150 points.)		
Name of Participant # 3		Written Exam (75 points)		
		Problem Solving (75 points)		
		<b>Participant # 3's Total</b> (Maximum score possible is 150 points.)		
Name of Participant # 4		Written Exam (75 points)		
		Problem Solving (75 points)		
		<b>Participant # 4's Total</b> (Maximum score possible is 150 points.)		
TEAM RANKING		<b>TOTAL TEAM SCORE</b>		
		(The three highest individual participant scores will make up the team score. Maximum score possible is 450 points.)		

**SMALL ENGINES CAREER DEVELOPMENT EVENT**

**CHAPTER** \_\_\_\_\_

Participant	Event Phase	Participant Score	Participant Total
<b>Name of Participant # 1</b>	<b>Written Examination</b> (75 points)		
	<b>Problem Solving</b> (75 points)		
	<b>Mechanics Skill #1</b> (25 points)		
	<b>Mechanics Skill #2</b> (25 points)		
	<b>Mechanics Skill #3</b> (25 points)		
	<b>Mechanics Skill #4</b> (25 points)		
<b>Participant # 1's Total</b> (Maximum score possible is 250 points.)			
<b>Name of Participant # 2</b>	<b>Written Examination</b> (75 points)		
	<b>Problem Solving</b> (75 points)		
	<b>Mechanics Skill #1</b> (25 points)		
	<b>Mechanics Skill #2</b> (25 points)		
	<b>Mechanics Skill #3</b> (25 points)		
	<b>Mechanics Skill #4</b> (25 points)		
<b>Participant # 1's Total</b> (Maximum score possible is 250 points.)			
<b>Name of Participant # 3</b>	<b>Written Examination</b> (75 points)		
	<b>Problem Solving</b> (75 points)		
	<b>Mechanics Skill #1</b> (25 points)		
	<b>Mechanics Skill #2</b> (25 points)		
	<b>Mechanics Skill #3</b> (25 points)		
	<b>Mechanics Skill #4</b> (25 points)		
<b>Participant # 1's Total</b> (Maximum score possible is 250 points.)			
<b>TEAM RANKING</b>		<b>TOTAL TEAM SCORE</b> (The three individual participant scores will make up the team score. Maximum score possible is 750 points.)	

