

Course Title:	Small Equipment Repair and Maintenance
Grade(s):	11th/12th

Course Description
This course concentrates on skills and knowledge of small power equipment used in the landscape, nursery, and forestry industries, including two-cycle and four-cycle engines. Chainsaws, lawn mowers, and snow blowers are typical applications. Students will learn how engine systems and their components work and how to troubleshoot issues within them. A small equipment Briggs and Stratton engine will be completely disassembled and reassembled in this course as part of the curriculum.
Approved Curricular Materials/Textbook(s)

Unit Title	Unit Description (Include Unit Objectives)	Unit Pacing
Unit 1: Introduction to Small Engines	This unit will provide a general overview of the small engine industry. Students will: • Explain the key characteristics of a small engine • Explore career opportunities within the industry • Explore the history and development of the small engine	2 weeks
Unit 2: Engine Classification	This unit covers different classification characteristics of engines. Students will: • Explain the difference between an internal and external combustion engine • Compare and contrast spark and compression ignition types • Describe the two-stroke and four-stroke engine cycles • Identify different cylinder designs and orientations • Determine the relationship between crankshaft orientation and cylinder orientation	2 weeks

	• Compare and contrast air-cooled and liquid-cooled engines	
Unit 3: Engine Safety	This unit will stress the importance of safety protocols and procedures when operating small engines. The unit will cover hazards associated with small engines and how to prevent injury. Students will: • Utilize an operator's manual to become familiar with their engines and identify common hazards associated with operation • Practice safe start-up and stopping procedures for small engines • Demonstrate safe practices while performing engine maintenance	2 weeks
Unit 4: Engine Systems and Parts	This unit will allow students to become familiar with various engine systems and their parts. Students will: • Explain the function of various engine systems • Identify the parts that make up each engine system • Explain the relationship between the parts of each system that allows it to perform its function	2 weeks
Unit 5: Engine Disassembly	In this unit, students will disassemble their Briggs and Stratton engine. Students will: • Properly utilize small engine tools • Identify the components of each system - fuel, compression, ignition, lubrication, cooling, and exhaust - through disassembly • Identify the parts of a carburetor and explain how each part functions to control fuel-air mixture in an engine	5 weeks
Unit 6: Engine Assembly	In this unit, students will assemble their Briggs and Stratton engine. Students will: • Utilize a micrometer to take precise engine measurements and determine clearances • Demonstrate proper part cleaning and preparation for assembly	5 weeks

	• Identify the specific components of engine parts and explain how they allow the part to perform its function • Properly utilize the tools used for small engine assembly	
Unit 7: Troubleshooting Small Engines	In this unit, students will perform a test run of their reassembled engines and troubleshoot any operating issues that may arise. Students will: • Evaluate engine systems for proper performance • Determine causes/factors that may contribute to an engine not starting • Assess poor performance issues and how to correct them • Identify characteristics of an engine with compression issues	2 weeks