

**Mission Statement:** It is the mission of the Elba Central School District to actualize the phrase “Elba Equals Educational Excellence for Everyone.” We are committed to providing both quality and equity. Every student will have the opportunity to develop to the best of his/her ability.

**Elba Standards:** In addition to the knowledge and basic skills they need in order to participate in society, graduates of Elba Central School will develop:

1. Empowering skills: decision making, goal setting, creative thinking and problem solving abilities;
2. Communication and social interaction skills;
3. Technological literacy;
4. Total wellness (social, physical, emotional health and self-esteem);
5. The values necessary to participate in society.

As a result of achieving these outcomes, our students will embrace lifelong learning.

**New York State Standards: MST**

**Standard 1:** Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions.

**Standard 2:** Students will access, generate, process, and transfer information using appropriate technologies.

**Standard 5:** Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.

**Standard 6:** Students will understand the relationships and common themes that connect mathematics, science, and technology and apply the themes to these and other areas of learning.

**Standard 7:** Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.

**National Standards:**

Standard 1: Students will develop an understanding of the characteristics and scope of technology.

Standard 2: Students will develop an understanding of the core concepts of technology.

Standard 3: Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study.

Standard 8: Students will develop an understanding of the attributes of design.

Standard 9: Students will develop an understanding of engineering design.

Standard 10: Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.

Standard 11: Students will develop abilities to apply the design process.

Standard 12: Students will develop abilities to use and maintain technological products and systems.

Standard 13: Students will develop abilities to assess the impact of products and systems.

Standard 16: Students will develop an understanding of and be able to select and use energy and power technologies.

Standard 18: Students will develop an understanding of and be able to select and use transportation technologies.

**Performance Indicators:**

Name and locate the parts of the two-stroke engine

Name and locate the parts of the four-stroke engine

Describe the process of the two-stroke engine

Describe the process of the four-stroke engine

Name some advantages of each type of engine

Name some disadvantages of each type of engine

Disassemble a two-stroke and four-stroke small engine

Reassemble a two-stroke and four-stroke small engine

Gap a spark plug to specifications

Torque a head bolt to specifications

Create fuel for a two-stroke engine with the correct fuel/oil ratio

<b>Assessment:</b>	<b>Acceptable Performance Level</b>
Local Technology Exams	Score of 70% or higher
Presentations	Score of 70% or higher
Projects	Score of 70% or higher

**Scope:** This is an introduction to anatomy and physiology on the 2-stroke and 4-stroke engine. Students will learn the parts of the engine and carburetion system, both through photos and reading, and the manual disassembly and reassembly of each type of engine. The different systems that make the engine work will be explored, such as the ignition system, lubrication system, and carburetion system. A history of the engine will be presented and discussed, as well as other engine designs that are not prevalent in society today.

**Sequence:**

- I. History of the Engine
- II. Wankel Engine
- III. Anatomy
  - a. Two-Stroke
    - i. Components
    - ii. Systems
  - b. Four-Stroke

- i. Components
    - ii. Systems
- IV. Physiology
  - a. Two Stroke
    - i. Compression
    - ii. Power
  - b. Four Stroke
    - i. Intake
    - ii. Compression
    - iii. Power
    - iv. Exhaust
- V. Tools Required for Engine Repair
- VI. Specification Charts
- VII. Disassembly
- VIII. Common Repairs
- IX. Reassembly

**Methodology:** 75-90% Hands on and visual learning. Remaining learning will take place through instruction, homework, and discussions.