Subject Area __Technology Education_____ **Grade Level** __7&8__

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:

Math, Science, and Technology Standards.

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:

1. Basic operations and concepts

   - Students demonstrate a sound understanding of the nature and operation of technology systems.
   - Students are proficient in the use of technology.
2. Social, ethical, and human issues
   - Students understand the ethical, cultural, and societal issues related to technology.
   - Students practice responsible use of technology systems, information, and software.
   - Students develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.
3. Technology productivity tools
   - Students use technology tools to enhance learning, increase productivity, and promote creativity.
   - Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.

4. Technology communications tools
   - Students use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.
   - Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.
5. Technology research tools
   - Students use technology to locate, evaluate, and collect information from a variety of sources.
   - Students use technology tools to process data and report results.
   - Students evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.
6. Technology problem-solving and decision-making tools
   - Students use technology resources for solving problems and making informed decisions.
   - Students employ technology in the development of strategies for solving problems in the real world.

Performance Indicators:

1. Demonstrate how the evolution of physical, biologically related, and information/ communication aspects of technology led to the shift from an agriculturally based...to an industrially based...to an information-based society.
2. Give one example (from each of the three aspects of technology) of an application of a modern tool, device, or method, which has evolved from simple beginnings and describe how it has changed daily routines and contributed to human progress.
3. Research examples of technological innovations from each of the three aspects of technology, which satisfy needs and wants and model one of these innovations.
4. Investigate the different forms of each resource category. Select one (or more) resource(s) and demonstrate how it (they) can be used.
5. Utilize the seven resources to produce a product, transport an object, grow living material, communicate an idea, or utilize the seven resources to implement a process and describe how full access to resources would have led to improved results.
6. Identify technological alternatives, which would be appropriate for two nations (with differing nonrenewable resources) to satisfy a given human need.
7. Design and implement the optimal solution to a given technological problem (which will involve biologically-related technology, information/communication technology and/or physical technology) and use a formalized problem solving method.
8. Identify constraints, which prevent a technological problem from being solved. Classify the constraints as those imposed by resource limitations, values, and/or attitudes of people and scientific principles.
9. Model a system in biologically related, information/communication and physical technology using the basic systems block diagram.
10. Apply the technological systems model to the safe assembly or construction and operation of a system, which encompasses biologically related, information/ communication, and/or physical technology.
11. Add feedback to close the loop in an operable open-looped system and then safely operate the system in order to bring actual results closer to desired results.

12. Identify the subsystems of a modern, complex technological system from each of the three aspects of technology and explain how they have been combined to generate the new system resulting in improved or additional human capabilities.

13. Demonstrate (in one or more of the three aspects of technology) outputs that are desired, undesired, expected, and unexpected.

14. Identify instances of the lack of fit between the technological system and the human user, identify techniques for improving the match between the technology, the human user, and the human-made environment, and demonstrate alternatives in order to improve the match in one or more of the given examples.

15. Identify instances of the lack of fit between the technological systems and the natural environment, identify techniques for improving the match between the technology and the natural environment, and model alternatives in order to improve the match.

16. Identify needed resources and a range of possible alternative resources that can be used to solve a given problem situation in each of the three aspects of technology.

17. Investigate the properties of various synthetic, raw, and biological materials through testing and describe why materials are often chosen on the basis of their properties.

18. Substitute different resource inputs for those originally provided in a functioning technological system, in order to optimize system outputs within given constraints.

19. Use a computer and appropriate computer software to access data about the resources given in a situation relating to one or more of the performance objectives above.

20. Perform a variety of traditional and modern material conversion processes within each of the three aspects of technology.

21. Process information and communicate a message using graphic, photographic, or electronic means.

22. Perform a variety of energy conversion processes within each of the three aspects of technology.

23. Process information using computer hardware and software to reach an informed decision on a problem with several variables.

24. Describe examples graphically of open-loop and closed-loop systems in the three aspects of technology.

25. Demonstrate the use of human and technological sensors to monitor the output of a process.

26. Assemble and operate a closed-loop technological system when given plans and access to necessary equipment.

27. Use a computer to control a technological system when given access to the necessary hardware and software.

28. Anticipate the consequences of a new technology using futuring techniques when given an example of a technological system in each of the three aspects of technology.

29. Describe how emerging technologies have created new jobs and made others obsolete in each of the three aspects of technology.

30. Propose alternative technological solutions to a local, national, and global issue and model one of the alternatives.

31. Draw and label a systems diagram which depicts the systems approach solution to a problem in each of the three aspects of technology.

32. Use a systems approach to develop a technological solution to a technological problem.

33. Use the computer as a record-keeping device to document progress while developing an optimal solution to the problem proposed in performance objective

Assessment:	Acceptable Performance Level
Local Technology Education Exams	Score of 70% or higher.

Projects	Score of 70% or higher

Scope: An introduction to technology, its systems, and management, which emphasizes that people must develop and control technology responsibly, and people have the capabilities to determine how technology can be applied to their benefit. The influence of technological systems on lifestyle, including home, school, and the world of work. The development of technology from when it first appeared and a look into the future.

Sequence: MODULE 1: *GETTING TO KNOW TECHNOLOGY*
Goal: Examining the historical evolution of technological innovation as a means through which human needs and wants are satisfied.
MODULE 2: *LEARNING WHAT RESOURCES ARE NEEDED FOR TECHNOLOGY*
Goal: Exploring and using the seven basic resources, which are necessary for technology
MODULE 3: *LEARNING HOW PEOPLE USE TECHNOLOGY TO SOLVE PROBLEMS*
Goal: Exploring and experiencing how people can solve technological problems by using a formalized problem solving "system."
MODULE 4: *LEARNING ABOUT SYSTEMS AND SUBSYSTEMS*
Goal: Becoming familiar with the structure, function, components and control of technological systems and gaining an understanding of the similarities that exist among physical, information/ communication and biologically related technological systems.
MODULE 5: *LEARNING HOW TECHNOLOGY AFFECTS PEOPLE AND THE ENVIRONMENT*
Goal: Understanding the positive and negative impacts of technology while instilling the perception that people must assume the responsibility for adapting technology to the environment and to the human user.
MODULE 6: *CHOOSING APPROPRIATE RESOURCES FOR TECHNOLOGICAL SYSTEMS*
Goal: Learning how to make informed choices in selecting the proper resources for technological systems and choosing resources from seven resource categories.
MODULE 7: *HOW RESOURCES ARE PROCESSED BY TECHNOLOGICAL SYSTEMS*
Goal: Learning how resources are processed by technological systems to meet human wants and needs and solving problems based on the conversion of energy, information, and materials from one form to another.
MODULE 8: *CONTROLLING TECHNOLOGICAL SYSTEMS*
Goal: Learning how technological systems are controlled in the three aspects of technology by feedback in closed-loop systems or by subsystems such as timers or computer programs in open-loop systems
MODULE 9: *TECHNOLOGY AND SOCIETY: NOW AND IN THE FUTURE*
Goal: Learning the social and environmental impacts of technology on society from a local, national, and global perspective by accessing current and future technological systems.
MODULE 10: *USING SYSTEMS TO SOLVE PROBLEMS*
Goal: Learning how to apply knowledge of systems to solve problems in biologically related, communications/information, and physical technology and to combine various subsystems to provide integrated solutions to realistic problems or challenges.

Methodology: 75% Hands-on, "design and construct" experiences.
- Building projects
- Gaming
- Researching
- Visualization
- Construction of Scale Models
- Presentation and Demonstration
- Role Playing
- Writing

- Discussion
- Reading
- Simulation
- Experimentation and Problem Solving