

Subject Area: Life Science

Grade Level: 7

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:

Key ideas are identified by numbers (1).

Performance indicators are identified by bullets (•).

Sample tasks are identified by triangles (▶).

The Living Environment

1. Living things are both similar to and different from each other and nonliving things.

Students:

- compare and contrast the parts of plants, animals, and one-celled organisms.
- explain the functioning of the major human organ systems and their interactions.

This is evident, for example, when students:

- ▶ conduct a survey of the school grounds and develop appropriate classification keys to group plants and animals by shared characteristics.
- ▶ use spring-type clothespins to investigate muscle fatigue or rulers to determine the effect of amount of sleep on hand-eye coordination.

2. Organisms inherit genetic information in a variety of ways that result in continuity of structure and function between parents and offspring.

Students:

- describe sexual and asexual mechanisms for passing genetic materials from generation to generation.
- describe simple mechanisms related to the inheritance of some physical traits in offspring.

This is evident, for example, when students:

- ▶ contrast dominance and blending as models for explaining inheritance of traits.
- ▶ trace patterns of inheritance for selected human traits.

3. Individual organisms and species change over time.

Students:

- **describe sources of variation in organisms and their structures and relate the variations to survival.**
- **describe factors responsible for competition within species and the significance of that competition.**

This is evident, for example, when students:

- ▶ conduct a long-term investigation of plant or animal communities.
- ▶ investigate the acquired effects of industrialization on tree trunk color and those effects on different insect species.

4. The continuity of life is sustained through reproduction and development.

Students:

- **observe and describe the variations in reproductive patterns of organisms, including asexual and sexual reproduction.**
- **explain the role of sperm and egg cells in sexual reproduction.**
- **observe and describe developmental patterns in selected plants and animals (e.g., insects, frogs, humans, seedbearing plants).**
- **observe and describe cell division at the microscopic level and its macroscopic effects.**

This is evident, for example, when students:

- ▶ apply a model of the genetic code as an analogue for the role of the genetic code in human populations.

5. Organisms maintain a dynamic equilibrium that sustains life.

Students:

- **compare the way a variety of living specimens carry out basic life functions and maintain dynamic equilibrium.**
- **describe the importance of major nutrients, vitamins, and minerals in maintaining health and promoting growth and explain the need for a constant input of energy for living organisms.**

This is evident, for example, when students:

- ▶ record and compare the behaviors of animals in their natural habitats and relate how these behaviors are important to the animals.
- ▶ design and conduct a survey of personal nutrition and exercise habits, and analyze and critique the results of that survey.

6. Plants and animals depend on each other and their physical environment.

Students:

- **describe the flow of energy and matter through food chains and food webs.**
- **provide evidence that green plants make food and explain the significance of this process to other organisms.**

This is evident, for example, when students:

- ▶ construct a food web for a community of organisms and explore how elimination of a particular part of a chain affects the rest of the chain and web.

7. Human decisions and activities have had a profound impact on the physical and living environment.

Students:

- describe how living things, including humans, depend upon the living and nonliving environment for their survival.
- describe the effects of environmental changes on humans and other populations.

This is evident, for example, when students:

- ▶ conduct an extended investigation of a local environment affected by human actions, (e.g., a pond, stream, forest, empty lot).

National Standards:

Life Science: Content Standards

As a result of their activities in grade 7, all students should develop understanding of:

- 1. Structure and function in Living Systems**
- 2. Reproduction and heredity**
- 3. Regulation and behavior**
- 4. Population and ecosystems**
- 5. Diversity and adaptations of organisms**

Performance Indicators: Description of the levels of student achievement pertaining to standard.

Assessment:	Acceptable Performance Level
1. NYS 8 th grade Science Exam	Level 3 or 4 on 8 th grade assessment as defined by NYS grading rubric for Life Science questions.
2. Teacher made exams (quizzes, exams, midterms, final) (any kind of test you are giving that is testing the performance indicator - formal or informal)	A passing score of 70 or better
3. homework, labs	A passing score of 70 or better

Scope:

Study of living things broken into thirteen major Units. The units are: Methods of Scientific Study, Characteristics of Living Things, Cells, Classification, Viruses and Monerans, Protists, Fungi, Plants, Animals, Genetics, Evolution, Ecology, and Human Biology.

Sequence:

I. Methods of Scientific Study

- A. Important prefixes/suffixes
- B. Scientific Method/ Experimentation
- C. Metric System and Conversions
- D. Scientific Tools
- E. Lab Safety

II. Characteristics of Living Things

- A. Origin of Life
- B. Characteristics of Living Things
- C. Needs of Living Things
- D. Chemistry of Living Things (optional)

III. Cells

- A. Cell Theory
- B. Structure and function of cells
- C. Cell processes
- D. Cell growth and division
- E. Cell specialization

IV. Classification

- A. Historical and modern
- B. 5 Kingdoms

V. Viruses and Monerans (Infectious Diseases)

- A. Defined
- B. Structure and Reproduction (Virus)
- C. Viruses and Humans
- D. Bacteria Structure and Life Functions
- E. Bacteria and Humans

VI. Protists

- A. Characteristics
- B. Plantlike, Animallike, Funguslike

VII. Fungi

- A. Characteristics, forms
- B. How affect other organisms

VIII. Plants

- A. Without Seeds
- B. With Seeds
 - Reproduction

IX. Animals

- A. Sponges, Cnidarians, Worms, and Mollusks
- B. Arthropods and Echinoderms
- C. Fishes and Amphibians
- D. Reptiles and Birds
- E. Mammals

X. Genetics

- A. History and Probability
- B. Chromosomes and DNA
- C. Human genetics
- D. Applied genetics

XI. Evolution

- A. Change over time
- B. Evidence of evolution
- C. Darwinian Theory
- D. Punctuated equilibrium

XII. Ecology

- A. Biotic interactions
- B. Cycles in nature
- C. Biomes
- D. Conservation

XIII. Human Biology (optional)

- A. Skeletal and muscular systems
- B. Digestive system
- C. Circulatory system
- D. Excretory system
- E. Nervous system
- F. Respiratory system
- G. Immune system
- H. Endocrine system
- I. Reproductive System

Methodology: Best Practices

- ❖ Use of lecture drawing on teacher and student's previous life experiences to demonstrate scientific concepts and theories.
- ❖ Homework assignments out of book that test for understanding.
- ❖ Incorporate the 6-traits as a method of assessing writing pieces within the scope of the course.

❖ Use of Labs to instruct through experience.

Labs include:

- Intro to microscope
- Cork and onion cells
- Plant and animal cells
- Classification- woodlot
- Classification- woodlot
- Examining Bacteria
- Algae, Mosses, and Ferns
- Pond Water
- Human Tissues and cells
- DNA
- Pulse rate, Blood pressure, and air volume
- Calorie Count Lab
- Ecology bio diversity- woodlot
- Nesting boxes