FLINT RIVER ACADEMY SCIENCE STANDARDS

Seventh Grade - Life Science

1. **Students will investigate the diversity of living organisms and how they can be compared scientifically.**
    a. Demonstrate the process for the development of a dichotomous key.
    b. Classify organisms based on physical characteristics using a dichotomous key of the six kingdom system (archaebacteria, eubacteria, protists, fungi, plants, and animals).

2. **Students will describe the structure and function of cells, tissues, organs, and organ systems.**
    a. Explain that cells take in nutrients in order to grow and divide and to make needed materials.
    b. Relate cell structures (cell membrane, nucleus, cytoplasm, chloroplasts, mitochondria) to basic cell functions.
    c. Explain that cells are organized into tissues, tissues into organs, organs into systems, and systems into organisms.
    d. Explain that tissues, organs, and organ systems serve the needs cells have for oxygen, food, and waste removal.
    e. Explain the purpose of the major organ systems in the human body (i.e., digestion, respiration, reproduction, circulation, excretion, movement, control, and coordination, and for protection from disease).

3. Students will recognize how biological traits are passed on to successive generations.
    a. Explain the role of genes and chromosomes in the process of inheriting a specific trait.
    b. Compare and contrast that organisms reproduce asexually and sexually (bacteria, protists, fungi, plants & animals).
    c. Recognize that selective breeding can produce plants or animals with desired traits.

4. Students will examine the dependence of organisms on one another and their environments.
    a. Demonstrate in a food web that matter is transferred from one organism to another and can recycle between organisms and their environments.
    b. Explain in a food web that sunlight is the source of energy and that this energy moves from organism to organism.
    c. Recognize that changes in environmental conditions can affect the survival of both individuals and entire species.
    d. Categorize relationships between organisms that are competitive or mutually beneficial.
    e. Describe the characteristics of Earth's major terrestrial biomes (i.e. tropical rain forest, savannah, temperate, desert, taiga, tundra, and mountain) and aquatic communities (i.e. freshwater, estuaries, and marine).

5. Students will examine the evolution of living organisms through inherited characteristics that promote survival of organisms and the survival of successive generations of their offspring.
    a. Explain that physical characteristics of organisms have changed over successive generations (e.g. Darwin's finches and peppered moths of Manchester).

b. Describe ways in which species on earth have evolved due to natural selection.
c. Trace evidence that the fossil record found in sedimentary rock provides evidence for the long history of changing life forms.

Investigation and experimentation

1.Students will explore of the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.

a. Understand the importance of—and keep—honest, clear, and accurate records in science.
b. Understand that hypotheses can be valuable, even if they turn out not to be completely accurate.

2. Students will use standard safety practices for all classroom laboratory and field investigations.

a. Follow correct procedures for use of scientific apparatus.
b. Demonstrate appropriate techniques in all laboratory situations.
c. Follow correct protocol for identifying and reporting safety problems and violations.

3. Students will have the computation and estimation skills necessary for analyzing data and following scientific explanations.

a. Analyze scientific data by using, interpreting, and comparing numbers in several equivalent forms, such as integers, fractions, decimals, and percents.
b. Use the mean, median, and mode to analyze a set of scientific data.
c. Apply the metric system to a scientific investigation that includes metric to metric conversion. (i.e. centimeters to meters)
d. Draw conclusions based on analyzed data.
e. Decide what degree of precision is adequate, and round off appropriately.
f. Address the relationship between accuracy and precision and the importance of each.

4. Students will use tools and instruments for observing, measuring, and manipulating equipment and materials in scientific activities.

a. Use appropriate technology to store and retrieve scientific information in topical, alphabetical, numerical, and keyword files, and create simple files.
b. Use appropriate tools for measuring objects and/or substances.
c. Learn and use on a regular basis standard safety practices for scientific investigations.

5. Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters.

a. Observe and explain how parts can be related to other parts in a system such as predator/prey relationships in a community/ecosystem.
b. Understand that different models (such as physical replicas, pictures, and analogies) can be used to represent the same thing.

6. Students will communicate scientific ideas and activities clearly.

a. Write clear, step-by-step instructions for conducting particular scientific investigations, operating a piece of equipment, or following a procedure.
b. Write for scientific purposes incorporating data from circle, bar and line graphs, two-way data tables, diagrams, and symbols.
c. Organize scientific information using appropriate simple tables, charts, and graphs, and identify relationships they reveal.

7. Students will question scientific claims and arguments effectively.

a. Question claims based on vague attributions (such as "Leading doctors say...") or on statements made by people outside the area of their particular expertise.
b. Identify the flaws of reasoning that are based on poorly designed research (i.e., facts intermingled with opinion, conclusions based on insufficient evidence).
c. Question the value of arguments based on small samples of data, biased samples, or samples for which there was no control.
d. Recognize that there may be more than one way to interpret a given set of findings.

8. Students will investigate the characteristics of scientific knowledge and how that knowledge is achieved. Students will apply the following to scientific concepts:

a. When similar investigations give different results, the scientific challenge is to judge whether the differences are trivial or significant, which often requires further study. Even with similar results, scientists may wait until an investigation has been repeated many times before accepting the results as meaningful.
b. When new experimental results are inconsistent with an existing, well-established theory, scientists may pursue further experimentation to determine whether the results are flawed or the theory requires modification.
c. As prevailing theories are challenged by new information, scientific knowledge may change.

9. Students will investigate the features of the process of scientific inquiry. Students will apply the following to inquiry learning practices:

a. Investigations are conducted for different reasons, which include exploring new phenomena, confirming previous results, testing how well a theory predicts, and comparing competing theories.
b. Scientific investigations usually involve collecting evidence, reasoning, devising hypotheses, and formulating explanations to make sense of collected evidence.
c. Scientific experiments investigate the effect of one variable on another. All other variables are kept constant.
d. Scientists often collaborate to design research. To prevent this bias, scientists conduct independent studies of the same questions.
e. Accurate record keeping, data sharing, and replication of results are essential for maintaining an investigator's credibility with other scientists and society.
f. Scientists use technology and mathematics to enhance the process of scientific inquiry.
g. The ethics of science require that special care must be taken and used for human subjects and animals in scientific research. Scientists must adhere to the appropriate rules and guidelines when conducting research.

FLINT RIVER ACADEMY SCIENCE STANDARDS

Flint River Academy
7th Grade Life Science

Life Science Curriculum Map

1st Nine Weeks				2nd Nine Weeks			3rd Nine Weeks			4th Nine Weeks
Safety and the Metric System	Living Things	Cell Processes	Genetics	Modern Genetics and Changes Over Time	Viruses, Bacteria, Prostist and Fungi	Invertebrates	Vertebrates	Plants	Ecology	Human Body and Health
2 weeks	2 weeks	3 weeks	2 weeks	2 weeks	3 weeks	4 weeks	4 weeks	3 weeks	2 weeks	9 weeks