Florida Department of Education
Adult General Education
Curriculum Framework

GED® PREPARATION SCIENCE	
Program Title	GED® Preparation
Program Number	9900130
Course Title	GED® Science
Course Number	9900133
CIP Number	1532020207
Grade Level	30, 31
Program Length	Varies

PURPOSE

Adult General Education Program: The Florida Department of Education (FDOE) administers the Adult General Education (AGE) Program in accordance with the statutory framework outlined in the following state and federal laws: Section (s.) 1004.02 Florida Statutes (F.S.),[1] s. 1004.93, F.S.,[2] and Title II of the Workforce Investment and Opportunity Act (WIOA), also known as the Adult Education and Family Literacy Act (AEFLA).[3]

As administered by the FDOE, AGE encompasses the following programs, services and activities:

- Academic Skills Building (ASB) Program
- Adult Basic Education (ABE) Program
- Adult High School (AHS) Program
- Adult English for Speakers of Other Languages (ESOL) Program
- GED® Program
- Integrated Education and Training (IET) Service Approach
- Integrated English Literacy and Civics Education (IELCE) Service Approach
- 2-Generation and Family Literacy Service Approaches
- Workforce Preparation Activities

The AGE Program is designed to serve the following objectives:

- Provide literacy instruction to adults to obtain the knowledge and skills necessary for employment and economic self-sufficiency.
- Facilitate adult learners to attain a secondary school diploma and progress to postsecondary education and training, including career pathways.
- Empower parents to obtain the education and skills that are necessary to participate as full partners in the educational development of their children and to achieve sustainable economic opportunities for their families.
- Deliver English language instruction to adult English language learners whose native language is other than English or who live in a family or community environment where a language other than English is the dominant language, to achieve competence in reading, writing, speaking and comprehension of the English language.

[1] http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&URL=1000-1099/1004/Sections/1004.02.html
[2] http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&URL=1000-1099/1004/Sections/1004.93.html
[3] https://www.congress.gov/113/bills/hr803/BILLS-113hr803enr.pdf

GED® Preparation Program: The purpose of the GED® Preparation Program is to prepare students to pass the GED® Test and be awarded a State of Florida High School Diploma. The program prepares students in four content-areas: Reasoning through Language Arts (RLA), Mathematical Reasoning, Science and Social Studies.

STUDENTS

Per State Board Rule 6A-6.014, Florida Administrative Code (F.A.C.) - General Requirements for Adult General Education[4], students eligible to enroll in the GED® Preparation Program are those who:

- Are 16 years of age or older.
- Are not enrolled in the K12 educational system.
- Score into National Reporting System (NRS) ABE Levels 5 or 6 on a state-approved reading test.

Per 1003.435(4), F.S.,[5] "A candidate for a high school equivalency diploma shall be at least 18 years of age on the date of the examination, except that in extraordinary circumstances, as provided for in rules of the district school board, a candidate may take the examination after reaching the age of 16."

EDUCATIONAL FUNCTIONING LEVELS

Educational Functioning Level (EFL) is a term found in WIOA (Code of Federal Regulations Title 34 Subtitle B Chapter IV Part 462)[6] that refers to the literacy levels in the GED® Science program. The GED® Science program has two EFLs, each representing a specific set of GED® Science skills. Additional information on the term EFL is available in the official NRS Technical Assistance Guide.[7]

Table 1: NRS EFLs for the GED® Science course in relation to the Grade Equivalent for each level

Course Title	NRS Educational Functioning Levels	Grade Equivalent
GED® Science	ABE Level 5	9.0 – 10.9
GED® Science	ABE Level 6	11.0 – 12.9

PROGRAM LENGTH

The maximum number of instructional hours recommended by the FDOE for the GED® Science course is 250 hours per EFL. Acknowledging the individualized nature of learning, some students may finish an EFL in fewer (or more) hours than the recommended maximum duration indicated.

Table 2: Recommended Maximum Number of Hours by Educational Functioning Level

Course Title	NRS Educational Functioning Levels	Recommended Maximum Hours
GED® Science	ABE Level 5	250
GED® Science	ABE Level 6	250

CURRICULUM AND INSTRUCTION

[4] https://www.flrules.org/gateway/ruleno.asp?id=6A-6.014
[5] https://www.flsenate.gov/laws/statutes/2012/1003.435
[6] https://www.ecfr.gov/current/title-34/subtitle-B/chapter-IV/part-462
[7] https://nrsweb.org/policy-data/nrs-ta-guide

The FDOE disseminates the GED® Science curriculum framework to agencies statewide, empowering local agency personnel to craft a curriculum relevant to the objectives of their students and instructors. Below is a structured outline of elements to consider when creating the local agency's curriculum:

1. **Educational Outcomes:**
    - Clearly defined outcomes that students are expected to achieve upon completion of the course.
2. **Core Instructional Materials:**
    - A set of materials (both print and digital) aligned with the defined educational outcomes. This can include textbooks, workbooks, online resources and multimedia materials.
3. **Needs Assessment Tools:**
    - Create a set of needs assessment tools to help teachers identify the specific learning needs and educational goals of individual students. This will aid in prioritizing standards and tailoring instruction to meet the varying needs of learners.
4. **Supplementary Textbooks:**
    - Provide workbooks covering the content of the GED® Science course.
5. **Pacing Guides and Matrices:**
    - Develop pacing guides and matrices that outline the scope and sequence of the curriculum. This helps in organizing the content over the duration of the course and ensures a logical progression of skills.
6. **Recommended Resources:**
    - Compile a list of recommended websites, films and dictionaries that can be utilized by teachers to supplement the curriculum. Ensure that these resources are relevant, up-to-date and support the varying needs of adult learners.
7. **Overview of Content:**
    - Provide an overview of the content of the GED® Science course.
8. **Learning Activities:**
    - Describe a variety of learning activities that can be used regularly for reinforcement. Include a mix of individual and group activities, hands-on projects, discussions and real-world application exercises.
9. **Vocabulary Lists:**
    - Utilize widely available vocabulary lists[8] designed specifically for the GED® Science course.
10. **Grammar and Language Skills:**
    - Provide instructors and students with widely available free educational products from the GED® Assessment Guide for Educators[9] designed specifically to enhance skills in grammar and language relevant to the GED® Science course.

It is recommended to continuously assess and update the agency's curriculum based on feedback, changes in educational standards and the evolving needs of learners. Regular collaboration with instructors and seeking input from the FDOE Bureau of Adult Education can further enhance the quality and effectiveness of the agency's curriculum.

Instructors are not obligated to follow the standards sequentially. The distinct needs of each group of students can guide instruction, empowering instructors to modify the sequence of teaching the standards.

ASSESSMENT

For guidance on the assessment guidelines and requirements for GED® Science, see State Board Rule 6.A-6.014, F.A.C.[10]

References for Assessment and Reporting: For complete information regarding assessment procedures and policies, see the FDOE Assessment Technical Assistance Paper.[11] For guidelines on the procedures for reporting data related to student test results, see the FDOE Division of Career and Adult Education (DCAE) Office of Research and Evaluation.[12]

[8] https://www.vocabulary.com/lists/sqwixtkp/ged
[9] https://ged.com/educators_admins/teaching/teaching_resources/
[10] https://www.flrules.org/gateway/ruleno.asp?id=6A-6.014

Pre-testing: Federal and state regulations mandate that local adult education agencies conduct pre-tests for all new students within the initial 12 hours of enrollment activity. The Florida DOE defines a new student as someone not previously enrolled in the local agency during the current or preceding program year. GED® Science students are required to pre-test and obtain a score at or above NRS EFL 5 in reading. The agency is responsible for submitting the pre-test results to the FDOE in accordance with the guidelines outlined by the DCAE Office of Research and Evaluation.

Post-testing: Agencies are not required to post-test students enrolled in the GED® Science course for NRS reporting purposes, however, students will benefit from a variety of assessments to gauge their knowledge and skills. The GED® Ready Test[13] is an appropriate tool for determining when the student is likely to be able to pass the GED® Test.

Course Completion: Students complete the GED® Science course when they pass the GED® Science subtest. Upon passing all subtests of the GED®, the agency is responsible for reporting the course completion date as reflected by the date on the student's diploma. The agency is responsible for reporting the post-test results to the FDOE following the guidelines outlined by the DCAE Office of Research and Evaluation.

ACCOMMODATIONS

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Adult students with disabilities must self-identify, provide documentation and request such services. Students with disabilities may need accommodations in areas such as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

ADULT EDUCATION INSTRUCTOR CERTIFICATION

Per 1012.39 (1)(b), F.S.,[14] each school district shall establish the minimal qualifications for part-time and full-time teachers in adult education agencies.

FLORIDA DOE IET SERVICE APPROACH[15]

The FDOE promotes the planning, development and implementation of an IET service approach that provides concurrent and contextualized adult education and literacy activities in combination with workforce preparation activities and workforce training for a specific occupation or occupational cluster for the purpose of educational and career advancement.

Florida's IET service approach is well-suited for meeting the specific needs of GED® Science students. Agencies are encouraged to create opportunities that seamlessly integrate education and career-focused content and deliver workforce preparation and training for GED® Science students.

The IET service approach provides students at all levels of adult education with the opportunity to acquire the skills needed to:

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[11] https://www.fldoe.org/core/fileparse.php/5398/urlt/2024FLAssessmentPolicy.pdf
[12] https://www.fldoe.org/academics/career-adult-edu/research-evaluation/
[13] https://ged.com/study/ged_ready/
[14] https://www.flsenate.gov/laws/statutes/2011/1012.39
[15] https://www.fldoe.org/academics/career-adult-edu/adult-edu/adult-edu-career-pathways.stml

- Progress to and complete postsecondary education and training programs.
- Obtain employment and advance in employment leading to economic self-sufficiency.
- Exercise the rights and responsibilities of citizenship.

All IET Programs must include the following three components as noted in the following sections of WIOA.[16]

- Adult education and literacy activities (WIOA Section 203(2)).
- Workforce preparation activities (WIOA Section 203(17)).
- Workforce training services (one or more) for a specific occupation or occupation cluster (WIOA Section 134(c)(3)(D)).

To meet the "integrated" requirement of IET, all services must include the following:

- Adult education and literacy activities run concurrently and contextually with workforce preparation activities and workforce training for a specific occupation or occupational cluster for the purpose of educational and career advancement.
- Activities are of sufficient intensity and quality, and based on the most rigorous research available, particularly with respect to improving reading, writing, mathematics and English proficiency of eligible individuals.
- Occur simultaneously.
- Use occupationally relevant instructional materials.

The IET program must have a single set of learning objectives that identifies specific adult education content, workforce preparation activities, workforce training competencies and that the program activities function cooperatively.

GED® Science Practices
The GED® Science course includes Science Practices, which delineate the skills essential to scientific reasoning in text and quantitative contexts.

Table 3: GED® Science Practices

GED® Science Practices
SP.1 Comprehending Scientific Presentations SP.1.a. Understand and explain textual scientific presentations Sp.1.b. Determine the meaning of symbols, terms and phrases as they are used in scientific presentations. SP.l.c. Understand and explain a non-textual scientific presentations
SP.2 Investigation Design (Experimental and Observational) SP.2.a. Identify possible sources of error and alter the design of an investigation to ameliorate that error SP.2.b. Identify and refine hypotheses for scientific investigations SP.2.c. Identify the strength and weaknesses of one or more scientific investigation (i, e, experimental or observational) designs SP.2.d. Design a scientific investigation SP.2.e. Identify and interpret independent and dependent variables in scientific investigations
SP.3 Reasoning from Data SP.3.a. Cite specific textual evidence to support a finding or conclusion. SP.3.b. Reason from data or evidence to a conclusion. SP.3.c. Make a prediction based upon data or evidence.

[16] https://www.congress.gov/113/bills/hr803/BILLS-113hr803enr.pdf

SP.3.d. Using sampling techniques to answer scientific questions.
SP.4 Evaluating Conclusions with Evidence SP.4.a. Evaluate whether a conclusion or theory is supported or challenged by particular data or evidence.
SP.5 Working with Findings SP.5.a. Reconcile multiple findings, conclusions or theories.
SP.6 Expressing Scientific Information SP.6.a. Express scientific information or findings visually. SP.6.b. Express scientific information or findings numerically or symbolically. SP.6.c. Express scientific information or findings verbally.
SP.7 Scientific Theories SP.7.a. Understand and apply scientific models, theories and processes. SP.7.b. Apply formulas from scientific theories.
SP.8 Probability & Statistics SP.8.a. Describe a data set statistically. SP.8.b. Use counting and permutations to solve scientific problems. SP.8.c. Determine the probability of events.

GED® Science Content Topics

The Science Content Topics identify the major topics in science and show the relationship between each Content Topic and the corresponding Theme.

Table 4: Science Content Topics Matrix:

Science Themes and Content Topics			
Theme	**Life Science (L) 40%**	**Physical Science (P) 40%**	**Earth & Space Science (ES) 20%**
Human and Health Living Systems	a. Human body and health b. Organization of life (structure and function of life) c. Molecular basis for heredity d. Evolution	a. Chemical properties and reactions related to human systems	a. Interactions between Earth's systems and living things
Energy & Related Systems	a. Relationships between life functions and energy intake b. Energy flows in ecologic networks (ecosystems)	a. conservation, transformation and flow of energy b. Work, motion and forces	a. Earth and its system components and interactions b. Structure and organization of the cosmos

GED® SCIENCE STANDARDS

LIFE SCIENCE STANDARDS

L.1	**Describe systems and functions of the human body systems and how to keep healthy.** L.1.a. Body systems (e.g., muscular, endocrine, nervous systems) and how they work together to perform a function (e.g., muscular and skeletal work to move the body). L.1.b. Homeostasis feedback methods that maintain homeostasis (e.g., sweating to maintain internal temperature) and effects of changes in the external environment on living things (e.g., hypothermia, injury). L.1.c. Sources of nutrients (e.g., foods, symbiotic organisms) and concepts in nutrition (e.g., calories, vitamins, minerals). L.1.d. Transmission of disease and pathogens (e.g., airborne, blood borne), the effects of disease or pathogens on populations (e.g., demographics change, extinction) and disease prevention methods (e.g., vaccination, sanitation).
L.2	**Explain the relationship between life functions and energy intake.** L.2.a. Energy for life functions (e.g., photosynthesis, respiration, fermentation).
L.3	**Explain the flow of energy in ecological networks (ecosystems).** L.3.a. Flow of energy in ecosystems (e.g., energy pyramids), conversation of energy in an ecosystem (e.g., energy lost as heat, energy passed on to other organisms) and sources of energy (e.g., sunlight, producers, lower-level consumer). L.3.b. Flow of matter in ecosystems (e.g., food webs and chains, positions of organisms in the web or chain) and the effects of change in communities or environment on food webs. L.3.c. Carrying capacity, changes in carrying capacity based on changes in populations and environmental effects and limiting resources necessary for growth. L.3.d. Symbiosis (e.g., mutualism, parasitism, commensalism) and predator/prey relationships (e.g., changes in one population affecting another population). L.3.e. Disruption of ecosystems (e.g., invasive species, flooding, habitat destruction and desertification) and extinction (e.g., causes [human and natural] and effects).
L.4	**Explain organization of life by structure and function of life.** L.4.a. Essential functions of life (e.g., chemical reactions, reproduction and metabolism) and cellular components that assist the functions of life (e.g., cell membranes, enzymes, energy). L.4.b. Cell theory (e.g., cells come from cells, cells are the smallest unit of living things), specialized cells and tissues (e.g., muscles, nerve, etc.) and cellular levels of organization (e.g., cells, tissues, organs, systems). L.4.c. Mitosis, meiosis (e.g. process and purpose).
L.5	**Describe the molecular basis for heredity.** L.5.a. Relationship of DNA, genes and chromosomes (e.g., description, chromosome splitting during meiosis) in heredity. L.5.b. Genotypes, phenotypes and the probability of traits in close relatives (e.g., Punnett squares, pedigree charts). L.5.c. New alleles, assortment of alleles (e.g., mutations, crossing over), environmental altering of traits and expression of traits (e.g., epigenetics, color points of Siamese cats).
L.6	**Describe the scientific theories of evolution.** L.6.a. Common ancestry (e.g., evidence) and cladograms (e.g., drawing, creating, interpreting). L.6.b. Selection (e.g., natural selection, artificial selection, evidence) and the requirements for selection (e.g., variation in traits, differential survivability). L.6.c. Adaptation, selection pressure and speciation.
PHYSICAL SCIENCE STANDARDS	

P.1	**Explain conservation, transformation and flow of energy.** P.1.a. Heat, temperature, the flow of heat results in work and the transfer of heat (e.g., conduction, convection). P.1.b. Endothermic and exothermic reactions. P.1.c. Types of energy (e.g., kinetic, chemical, mechanical) and transformations between types of energy (e.g., chemical energy [sugar] to kinetic energy [motion of a body]). P.1.d. Sources of energy (e.g., sun, fossil fuels, nuclear) and the relationships between different sources (e.g., levels of pollutions, amount of energy produced). P.1.e. Types of waves, parts of waves (e.g., frequency, wavelength), types of electromagnetic radiation, transfer of energy by waves and the uses and dangers of electromagnetic radiation (e.g. radio transmission, UV light and sunburns).
P.2	**Explain the relationship of work, motion and forces.** P.2.a. Speed, velocity, acceleration, momentum and collisions (e.g., inertia in a car accident, momentum transfer between two objects). P.2.b. Force, Newton's Laws, gravity, acceleration due to Gravity (e.g., freefall, law of gravitational attraction), mass and weight. P.2.c. Work, simple machines (types and functions), mechanical advantages (forces, distance and simple machines) and power.
P.3	**Describe the chemical properties and reactions related to living systems.** P.3.a. Structure of matter. P.3.b. Physical and chemical properties, changes of state and density. P.3.c. Balancing chemical equations and different types of chemical equations, conservation of mass in balanced chemical equations and limiting reactants. P.3.c. Parts in solutions, general rules of solubility (e.g., hotter solvents allow more solute to dissolve), saturation and the differences between weak and strong solutions.
EARTH AND SPACE SCIENCE STANDARDS	
ES.1	**Describe Interactions between earth's systems and living things.** ES.1.a. Interactions of matter between living and non-living things (e.g., cycles of matter) and the location, uses and dangers of fossil fuels. ES.1.b. Natural Hazards (e.g., earthquakes, hurricanes, etc.) their effects (e.g., frequency, severity and short- and long-term effects) and mitigation thereof (e.g., dikes, storm shelters, building practices). ES.1c. Extraction and use of natural resources, renewable vs. nonrenewable resources and sustainability.
ES.2	**Describe Earth and its System Components and Interactions.** ES.2.a. Characteristics of the atmosphere, including its layers, gases and their effects on the Earth and its organisms, include climate change. ES.2.b. Characteristics of the oceans (e.g., salt water, currents, coral reefs) and their effects on Earth and organisms. ES.2.c. Interactions between Earth's systems (e.g., weathering caused by wind or water on rock, wind caused by high/low pressure and Earth rotation, etc.). ES.2.d. Interior structure of the Earth (e.g., core, mantle, crust, tectonic plates) and its effects (e.g., volcanoes, earth quakes, etc.) and major landforms of the Earth (e.g., mountains, ocean basins, continental shelves, etc.).
ES.3	**Describe the structures and organization of the Cosmos.** ES.3.a. Structures in the universe (e.g., galaxies, stars, constellations, solar systems), the age and development of the universe and the age and development of Stars (e.g., main sequence, stellar development, deaths of stars [black hole, white dwarf]). ES.3.b. Sun, planets and moons (e.g., types of planets, comets, asteroids), the motion of the Earth's motion and the interactions within the Earth's solar system (e.g., tides, eclipses). ES.3.c. The age of the Earth, including radiometrics, fossils and landforms.