Intensive English
Science

ESL 181 Science

0 credit
5 days per week; 1 year
Taught in English

This is a ***required course for IE grade students*** in the CAT program only. This course introduces students to a variety of topics covered in Life and Earth science, Chemistry and Physics. This course helps students acquire the vocabulary needed to comprehend scientific concepts and processes that will facilitate their learning and encourage them to continue guiding their knowledge of Science.

Duran, Elva, et al. Access ESL Science. Great Source Education Group: Wilmington: Massachusetts, 2005 Edition.
Workbook: Duran, Elva, et al. Access ESL Science Practice Book. Great Source Education Group: Wilmington, Massachusetts, 2005 Edition.

Prerequisite: NONE

Benchmark Code—Subject: Intensive English Science = IES
Strand 1: Life Science
Strand 2: Earth Science
Strand 3: Physical Science
Strand 4: Scientific Inquiry

Code- Subject.Strand #.Standard#.Benchmark#
Example: IES.3. 2.4 – Intensive English Science, Strand 3, Standard 2, Benchmark 4

Strand 1: Life Science

Standard 1: The student uses classification systems to describe groups of living things, compares and contrasts differences in the life cycles of living things; investigates and explains how living things obtain and use energy; and analyzes how parts of living things are adapted to carry out specific functions.

Benchmark Code	Benchmark
IES.1.1.1	The student will compare and classify organisms into major groups on the basis of their structure.
IES.1.1.2	The student will describe the basic characteristics of living things and classify them into kingdoms.
IES.1.1.3	The student will identify the parts of a flowering plant.
IES.1.1.4	The student will use content related vocabulary to describe the life cycle of a flowering plant.
IES.1.1.5	The student will describe the process of photosynthesis and the evidence that plants make and store food using specific vocabulary related to the content.
IES.1.1.6	The student will classify the animal kingdom into its subgroups, and identify the characteristics of each group using the corresponding vocabulary.

Standard 2: The student explains how parts of an ecosystem are related and how they interact; explains how energy is distributed to living things in an ecosystem; and describes how materials cycle through an ecosystem and get reused in the environment.	
Benchmark Code	Benchmark
IES.1.2.1	The student will define ecology.
IES.1.2.2	The student will identify components of an ecosystem.
IES.1.2.3	The student will explain the interaction and interdependence of nonliving and living components within ecosystems.
IES.1.2.4	The student will observe and describe how organisms including producers, consumers, and decomposers live together in an environment and use existing resources.
IES.1.2.5	The student will describe how all organisms in an ecosystem acquire energy directly or indirectly from sunlight.
IES.1.2.6	The student will recognize that every organism occupies a niche.
IES.1.2.7	The student will trace and interpret the flow of energy through an ecosystem and demonstrate knowledge of the roles of producers, consumers, and decomposers in the ecosystem.
IES.1.2.8	The student will demonstrate knowledge of the natural cycles, such as the carbon cycle, nitrogen cycle, water cycle, and oxygen cycle.
IES.1.2.9	The student will describe how different environments support different varieties of organisms
IES.1.2.10	The student will demonstrate knowledge that an ecosystem includes living and nonliving factors, and that humans are an integral part of ecosystems.
IES.1.2.11	The student will define the concept of pollutant and describe the effects of various pollutants on ecosystems.
IES.1.2.12	The student will understand that human actions can create risks and consequences in the environment.
IES.1.2.13	The student will investigate and analyze how technology affects the physical, chemical, and biological factors in an ecosystem.

Strand 2: Earth Science	
Standard 1: The student knows and that obtaining, transforming, and distributing energy affects the environment.	
Benchmark Code	Benchmark
IES.2.1.1	The student will research and describe energy types from their source to their use and determine if the type is renewable, non-renewable, or inexhaustible.
IES.2.1.2	The student will distinguish between renewable and nonrenewable resources and understand that nonrenewable natural resources are not replenished through the natural cycles and thus are strictly limited in quantity.
IES.2.1.3	The student will identify energy transformations occurring during the production of energy for human use such as electrical energy to heat energy or heat energy to electrical energy.
IES.2.1.4	The student will compare methods used for transforming energy in devices such as hydroelectric and wind power plants.

IES.2.1.5	The student will compare the uses of different energy resources and their effects upon the environment, and identify their advantages and disadvantages.
IES.2.1.6	The student will evaluate the biodegradability of renewable and nonrenewable natural resources.

Strand 3: Physical Science	
Standard 1: The student knows and uses content specific vocabulary to express understanding of our solar system.	
Benchmark Code	Benchmark
IES.3.1.1	The student will identify characteristics of objects in our solar system including the Sun, planets, meteorites, comets, asteroids, and moons.
IES.3.1.2	The student will compare and contrast the celestial bodies in our solar system.
IES.3.1.3	The student will identify and illustrate how the tilt of the Earth on its axis as it rotates and revolves around the Sun causes changes in seasons and the length of a day.
IES.3.1.4	The student will relate the Earth's movement and the moon's orbit to the observed cyclical phases of the moon.
IES.3.1.5	The student will create a model of the Earth-moon-sun system to explain day and night, a year, eclipses, moon phases, and tides.
IES.3.1.6	The student will understand the force of gravity and the ways gravity governs motion in the solar system and objects on Earth.
Standard 2: The student understands the basic nature of matter.	
Benchmark Code	Benchmark
IES.3.2.1	The student will define matter.
IES.3.2.2	The student will identify the composition and structure of matter.
IES.3.2.3	The student will define the atomic structure, and recognize that atoms and molecules are perpetually in motion.
IES.3.2.4	The student will investigate, measure, and communicate the properties of different substances, which are independent of the amount of the substance.
IES.3.2.5	The student will classify substances as elements and compounds and create models to represent them.
IES.3.2.6	The student will distinguish between compounds and mixtures.
Standard 3: The student knows that substances have physical and chemical properties.	
Benchmark Code	Benchmark
IES.3.3.1	The student will identify and measure physical properties of objects or substances (mass, weight, area, temperature, dimensions, volume, and density).
IES.3.3.2	The student will describe the four states of mater and how energy affects them.
IES.3.3.3	The student will describe the arrangement and motion of molecules in solids, liquids, and gases.
IES.3.3.4	The student will explain how matter changes states.
IES.3.3.5	The student will differentiate between physical and chemical properties, macro and microscopically.

IES.3.3.6	The student will identify and demonstrate everyday examples of chemical phenomena such as rusting and tarnishing of metals and burning of wood.

Standard 4: The student demonstrates knowledge of the periodic table of the elements.	
Benchmark Code	Benchmark
IES.3.4.1	The student will identify and apply symbols, atomic numbers, and atomic mass.
IES.3.4.2	The student will classify elements such as metals, metalloids, and nonmetals.
IES.3.4.3	The student will locate elements along the periodic table.
IES.3.4.4	The student will identify patterns in the periodic table.
IES.3.4.5	The student will describe physical properties of elements and identify how they are used to position an element of the periodic table.
IES.3.4.6	The student will demonstrate that new substances can be made when two or more substances are chemically combined and compare the properties of the new substances to the original substances.
IES.3.4.7	The student will understand and define the Law of Conservation of Matter.

Standard 5: The student demonstrates comprehension of the concept of energy and identifies and describes forms of energy.	
Benchmark Code	Benchmark
IES.3.5.1	The student will describe the concept of energy and define and differentiate between kinetic and potential energy.
IES.3.5.2	The student will describe the Law of Conservation of Energy.
IES.3.5.3	The student will describe the many common forms energy takes (mechanical, heat, light, sound, electrical, magnetic, chemical nuclear, and radiant).
IES.3.5.4	The student will describe how common forms of energy can be transformed, one to another.
IES.3.5.5	The student will investigate and demonstrate the movement of heat energy through solids, liquids, and gases.

Standard 6: The student demonstrates knowledge of force and motion.	
Benchmark Code	Benchmark
IES.3.6.1	The student will define the concept of force, distinguishing between various types, and evaluating the effects they have on an object's motion.
IES.3.6.2	The student will identify various simple machines, analyze their mechanical advantage, and relate them to work and power.
IES.3.6.3	The student will describe gravity, friction, and motion.
IES.3.6.4	The student will calculate speed and velocity of an object.
IES.3.1.5	The student will recognize Newton's Laws and their effects on forces and motion.

Strand 4: Scientific Inquiry	
Standard 1: The student understands and applies principles of scientific inquiry.	
Benchmark Code	Benchmark
IES.4.1.1	The student will identify different types of science.

IES.4.1.2	The student will interpret and use vocabulary related to the scientific method.
IES.4.1.3	The student will identify the scientific method and formulate simple hypotheses.