

Saddlebrook Preparatory School
Course Description
General Science

Course Standards

The Nature of Matter

The students will understand that all matter has observable, measurable properties.

- identify various ways in which substances differ (e.g. mass, volume, shape, density, texture, and reaction to temperature and light).
- understand the differences between weight and mass.
- know that temperature measures the average energy of motion of the particles that make up the substance.
- know that atoms in solids are close together and do not move around easily; in liquids, atoms tend to move farther apart; in gas, atoms are quite far apart and move around freely.

The students will understand the basic principles of atomic theory.

- describe and compare the properties of particles, and waves.
- know the general properties of the atom (a massive nucleus of neutral neutrons and positive protons surrounded by a cloud of negative electrons) and accept that single atoms are not visible.
- know that radiation, light, and heat are forms of energy used to cook food, treat disease, and provide energy.

Energy

The students will recognize that energy may be changed in form with varying efficiency.

- know the various forms in which energy come to Earth from the sun (e.g. visible light, infrared and microwave).

The students will understand the interaction of matter and energy.

- know that most events in the universe (e.g., weather changes, moving cars, and the transfer of a nervous impulse in the human body) involve some form of energy transfer and that these changes almost always increase the total disorder of the system and its surroundings, reducing the amount of useful energy.
- know that most of the energy used today is derived from burning stored energy collected by organisms millions of years ago (i.e., nonrenewable fossil fuels).

Processes that Shape the Earth

The students will recognize that processes in the lithosphere, atmosphere, hydrosphere, and biosphere interact to shape the Earth.

- know that mechanical and chemical activities shape and reshape the Earth's land surface by eroding rock and soil in some areas and depositing them in other areas, sometimes in seasonal layers.
- know that over the whole Earth, organisms are growing, dying, and decaying as new organisms are produced by the old ones.

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- know how conditions that exist in one system influence the conditions that exist in other systems.
- know the ways in which plants and animals reshape the landscape (e.g., bacteria, fungi, worms, rodents, and other organisms add organic matter to the soil increasing soil fertility, encouraging plant growth, and strengthening resistance to erosion).
- understand concepts of time and size relating to the interaction of Earth's processes (e.g., lightning striking in a split second as opposed to the shifting of the Earth's plates altering the landscape, distance between atoms as opposed to distance between stars).

The students will understand the need for protection of the natural systems on Earth.

- know the positive and negative consequences of human action on the Earth's systems.

Earth and Space

The students will understand that there is interaction and organization in the Solar System and the universe and how this affects life on Earth.

- understand the vast size of our Solar System and the relationship of the planets and their satellites.
- know that available data from various satellite probes show the similarities and differences among planets and their moons in the Solar System.
- understand that our sun is one of many stars in our galaxy.
- know that stars appear to be made of similar chemical elements, although they differ in age, size, temperature, and distance.

The students will recognize the vastness of the universe and the Earth's place in it.

- know that thousands of other galaxies appear to have the same elements, forces, and forms of energy found in our Solar System.

Processes of Life

The students will describe patterns of structure and function in living things.

- understand that living things are composed of major systems that function in reproduction, growth, maintenance, and regulation.
- know that behavior is a response to the environment and influences growth, development, maintenance, and reproduction.

The students will understand the process and importance of genetic diversity.

- know that generally organisms in a population live long enough to reproduce because they have survival characteristics.
- know that the fossil record provides evidence that changes in the kinds of plants and animals in the environment have been occurring over time.

How Living Things Interact with Their Environment

The students will understand the competitive, interdependent, cyclic nature of living things in the environment.

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- know that biological adaptations include changes in structures, behaviors, or physiology that enhance reproductive success in a particular environment.
- know that the interactions of organisms with each other and with the nonliving parts of their environments result in the flow of energy and the cycling of matter throughout the system.
- know that life is maintained by a continuous input of energy from the sun and by the recycling of the atoms that make up the molecules of living organisms.

The students will understand the consequences of using limited natural resources.

- know that some resources are renewable and other are nonrenewable.
- know that a brief change in the limited resources of an ecosystem may alter the size of a population or the average size of individual organisms and that long-term change may result in the elimination of animal and plant populations inhabiting the Earth.
- understand that humans are a part of an ecosystem and their activities may deliberately or inadvertently alter the equilibrium in ecosystems.

The Nature of Science

The students will use the scientific process and habits of mind to solve problems.

- know that the scientific knowledge is subject to modification as new information challenges prevailing theories and as a new theory leads to looking at old observations in a new way.
- know that the study of the events that led scientists to discoveries can provide information about the inquiry process and its effects.
- know that science disciplines differ from one another in topic, techniques, and outcomes, but that they share a common purpose, philosophy, and enterprise.
- know that accurate record keeping, openness, and replication are essential to maintaining an investigator's credibility with other scientists and society.
- know that a change in one or more variables may alter the outcome of an investigation.
- recognizes the scientific contributions that are made by individuals of diverse backgrounds, interests, talents, and motivations.
- know that when similar investigations give different results, the scientific challenge is to verify whether the differences are significant by further study.

The students will understand that most natural events occur in comprehensible, consistent patterns

- recognizes that patterns exist within and across systems

The students will understand that science, technology, and society are interwoven and interdependent.

- know that science ethics demand that scientists must not knowingly subject coworkers, students, the neighborhood, or the community to health or property risks.
- know that special care must be taken in using animals in scientific research.

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- know that in research involving human subjects, the ethics of science require that potential subjects be fully informed about the risks and benefits associated with the research and of their right to refuse to participate.
- know that technological design should require taking into account constraints such as natural laws, the properties of the materials used, and economic, political, social, ethical, and aesthetic values.
- understand that contributions to the advancement of science, mathematics, and technology have been made by different kinds of people, in different cultures, at different times, and are an intrinsic part of the development of human culture.
- know that no matter who does science and mathematics or invents things, or when or where they do it, the knowledge and technology that result can eventually become available to everyone.
- know that computers speed up and extend people's ability to collect, sort, and analyze data; prepare research reports; and share data and ideas with others.

ESOL Modifications at Saddlebrook Preparatory:

- small group and one on one ESOL instruction and content support from ESOL teacher.
- extended time on assignments and assessments.
- use of bilingual dictionary or glossary where appropriate (i.e.: not on a definitions test)
- content read and reworded, adapted to the student's proficiency level.
- questions read and reworded
- separate testing location
- proficiency level taken into account on assessment of grammar and mechanics on written assignments, however progress is expected over the course of the year.