

Gifted Science

GRADE 5

At the end of the school year, students will be able to...

GOAL 11 Inquiry

(Integrated into the whole year) Understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems.

STANDARD A**Know and apply the concepts, principles and processes of scientific inquiry.**

- _____ Formulate questions on a specific science topic and choose the steps needed to answer the question.
- _____ Collect data for investigations using scientific process skills including observing, estimating, measuring.
- _____ Construct charts and visualizations to display data.
- _____ Use data to produce reasonable explanations.
- _____ Report and display the results of individual and group investigations.

STANDARD B**Know and apply the concepts, principles and processes of technological design.**

- _____ Identify a design problem and propose possible solutions.
- _____ Develop a plan, design and procedure to address the problem identifying constraints (e.g., time, materials, technology).
- _____ Build a prototype of the design using available tools and materials.
- _____ Test the prototype using suitable instruments, techniques and quantitative measurements to record data.
- _____ Assess test results and the effectiveness of the design using given criteria and noting possible sources of error.
- _____ Report test design, test process and test results.

GOAL 12 Concepts

Understand the fundamental concepts, principles and interconnections of the life, physical and earth/space sciences.

STANDARD A**Know and apply concepts that explain how living things function, adapt and change.****STANDARD B****Know and apply concepts that describe how living things interact with each other and with their environment.****UNIT 1 ECOSYSTEMS**

- _____ Describe food chains and food webs and their relationship in an ecosystem.
- _____ Describe the parts of various types of ecosystems.
- _____ Explain how Earth's systems recycle materials such as water, carbon and nitrogen.
- _____ Compare and contrast different biomes.
- _____ Explain how the living and nonliving things interact in an ecosystem.
- _____ Explain that ecosystems go through both slow and sudden change.

UNIT 2 CELLS and the KINGDOM OF LIFE

- _____ Identify cells as the basic unit of living things.
- _____ Compare and contrast plant and animal cells.
- _____ Explain how cells use energy and different substances to carry on life functions.
- _____ Describe the life cycle of cells and living things.
- _____ Describe how living things are classified and identified by characteristics.
- _____ Identify the six kingdoms and ways they are alike and different.

UNIT 3 INHERITING TRAITS

- _____ Describe how traits are passed on from one generation to the next.
- _____ Identify how traits are predicted by the laws of probability.
- _____ Identify how heredity materials found in chromosomes is encoded and controls the traits of living things.
- _____ Explain how the appearance of certain traits is determined by genes.

STANDARD C**Know and apply concepts that describe properties of matter and energy and the interaction between them.**

STANDARD D

Know and apply concepts that describe force and motion and the principles that explain them.

UNIT 4 PROPERTIES and CHANGES OF MATTER

- _____ Identify properties of matter.
- _____ Identify that matter is made of elements and compounds.
- _____ Describe how elements are the simplest substances and are composed of atoms.
- _____ Compare and contrast chemical changes.
- _____ Explain how density can be measured.
- _____ Identify mixtures and solutions and their properties.
- _____ Compare and contrast physical and chemical changes.
- _____ Identify how chemical reactions can produce electrical energy.

UNIT 5 TEMPERATURE, HEAT and ENERGY

- _____ Describe how temperature and heat depend on the energy of moving objects.
- _____ Identify how heat changes matter physically.
- _____ Explain how energy comes from different sources but ultimately all energy is from the sun.

STANDARD E

Know and apply concepts that describe the features and processes of the Earth and its resources.

STANDARD F

Know and apply concepts that explain the composition and structure of the universe and the Earth's place in it.

UNIT 6 WEATHER PATTERNS and CLIMATE

- _____ Identify how the sun warms the Earth's surface and transmits heat to the air above it.
- _____ Describe how water on Earth's surface and in the atmosphere changes form and affects the weather.
- _____ Identify how water vapor and ice form clouds that produce precipitation.
- _____ Identify how differences in air pressure on Earth's surface cause wind.
- _____ Identify how weather changes often occur at fronts where different air masses meet.
- _____ Describe tornadoes and hurricanes and the damage they can cause.
- _____ Identify how long term weather patterns determine climates, which can change over time.
- _____ Identify and use weather instruments that measure weather patterns.

UNIT 7 OBSERVING THE SKY

- _____ Describe instruments astronomers use to study the universe.
- _____ Explain how day and night are caused by the Earth's revolution around the sun and rotation on its axis.
- _____ Describe how the movement of the moon, as it orbits Earth, changes the Moon's appearance, creates eclipses and affects tides.

UNIT 8 EARTH'S AIR, WATER and ENERGY

- _____ Describe how air is a vital resource that can be degraded by air pollution.
- _____ Describe how water is a vital resource that can be degraded by pollution.
- _____ Identify renewable and nonrenewable energy resources.
- _____ Classify recyclable materials.

GOAL 23 Human Body

Understand human body systems and factors that influence growth and development.

STANDARD A

Describe and explain the structure and functions of the human body systems and how they interrelate.

STANDARD B

Explain the effects of health-related actions on the body systems.

STANDARD C

Describe factors that affect growth and development.

UNIT 9 BLOOD and AIR

- _____ Describe the structure and function of the circulatory system.
- _____ Describe the structure and function of the respiratory system.

UNIT 10 USING FOOD and STAYING FIT

- _____ Describe the structure and function of the digestive system.
- _____ Describe how diet and exercise are important to maintain the health of the body.

UNIT 11 THE SYSTEMS OF CONTROL

- _____ Identify the structure and function of the nervous system.

GOAL 13 Connections

Understand the relationship among science, technology and society in historical and contemporary contexts.

STANDARD A

Know and apply the accepted practices of science.

- _____ Demonstrate ways to avoid injury when conducting science activities (e.g., wearing goggles, fire extinguisher use).
- _____ Explain why similar investigations may not produce similar results.
- _____ Explain why keeping accurate and detailed records are important.

STANDARD B

Know and apply concepts that describe the interaction between science, technology and society.

- _____ Explain how technology is used in science for a variety of purposes (e.g., sample collection; storage and treatment; measurement; data collection; storage and retrieval; communication of information).
- _____ Describe the effects on society of scientific and technological innovations (e.g., antibiotics, steam engine, digital computer).
- _____ Identify and explain ways that science and technology influence the lives and careers of people.
- _____ Compare the relative effectiveness of reducing, reusing and recycling in actual situations.
- _____ Identify and explain ways that technology changes ecosystems (e.g., dams, highways, buildings, communication networks, power plants).
- _____ Analyze how specific personal and societal choices that humans make affect local, regional and global ecosystems (e.g., lawn and garden care, mass transit).