

*** Indicates Power Standard**

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.

INTRODUCTION TO SCIENCE (Earth Science Unit in Holt Text)

- _____ Formulate a hypothesis and discuss real world examples.
- _____ Describe the steps in the scientific method and how to design a controlled experiment.
- _____ Construct charts, graphs and visualizations of data.
- _____ Give examples of models and how they are similar and different from what they represent.
- _____ Identify tools scientists use to collect data.
- _____ Use measuring equipment with correct units.
- _____ ***Interpret, draw conclusions and report the results of a scientific investigation**

STANDARD B

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

- _____ Formulate a design problem and establish criteria for determining the success of a solution.
- _____ Compare different plans and solutions based on given constraints (e.g. cost, time, trade offs, materials, space, safety).
- _____ ***Evaluate the test results based on established criteria and recommend improvements.**
- _____ Report the relative success of the design based on test results and criteria.

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.

ENVIRONMENTAL SCIENCE

- _____ Explain the roles and connections between living and nonliving things in an environment.
- _____ ***Identify the organisms in a food chain or food web as either producers or consumers, and describe their role in the community.**
- _____ Explain how changes in the population of one organism affect the populations of other organisms.
- _____ ***Interpret diagrams of cycles in nature (e.g. water cycle, carbon cycle, nitrogen cycle).**
- _____ Describe the process of succession.
- _____ ***Compare and contrast biomes on Earth.**
- _____ ***Discuss major environmental problems and possible solutions.**
- _____ ***Compare renewable and nonrenewable resources, ways they can be conserved and possible alternatives.**
- _____ Identify types of fossil fuels, problems associated with their use and possible alternatives.

STANDARD C

Know and apply concepts that describe properties of matter and energy and the interactions between them.

INTERACTIONS OF MATTER

- _____ ***Identify the number of valence electrons in an atom and how this relates to bonding.**
- _____ ***Compare and contrast ionic, covalent and metallic bonds.**
- _____ ***Describe how chemical reactions produce new substances with different chemical and physical properties.**
- _____ ***Interpret simple formulas and equations.**
- _____ Recognize that energy is either absorbed or released, but mass is conserved in a chemical reaction
- _____ Describe factors that effect the rate of a reaction.
- _____ Recognize that compounds have unique properties that describe them.
- _____ ***Compare and contrast acids and bases (e.g. properties, formulas, household examples, pH, reaction to litmus.)**
- _____ Describe organic chemicals and biochemicals and why they are important in everyday life.
- _____ Describe the basic principles of radioactivity.

STANDARD E

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

INSIDE THE RESTLESS EARTH

- _____ *Compare and contrast rocks and minerals, describe their properties and tests to identify them.
- _____ *Describe the formation and characteristics of igneous, sedimentary and metamorphic rocks.
- _____ Compare relative and absolute dating and how the geologic column is used in the process of dating.
- _____ *Identify types and formations of fossils and what they tell us about the past.
- _____ *Identify the layers of the Earth by their physical properties.
- _____ Describe the current plate tectonics theory and interpret evidence for it.
- _____ *Explain the effects that plate tectonics has on the Earth's crust (e.g. faults, folds, uplift, volcanoes, earthquakes).
- _____ Describe the cause, measurement of, and effects of earthquakes.
- _____ Identify the features, types, cause and effects of volcanoes.

STANDARD F

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

ASTRONOMY

- _____ *Describe early ideas of the structure of the universe and the contributions of important scientists to our understanding of it.
- _____ Explain the use of tools to study and map the universe.
- _____ *Describe the characteristics of stars.
- _____ Identify the organization of the universe and theories of how it was formed.
- _____ *Describe the structure, formation and movement of the sun and the members of the solar system.
- _____ *Compare and contrast characteristics of the inner and outer planets, including the effects of gravity and motion
- _____ *Explain how the position of the moon, Earth and sun results in various moon phases and eclipses.
- _____ Recognize differences between rockets, satellites, space stations and space probes.
- _____ Summarize the highlights of the history of space flight and man-made space objects.

Goal 13 Connections

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

STANDARD A

Know and apply the accepted practices of science.

- _____ *Demonstrate lab safety procedures and accepted practices of science.
- _____ Describe that important decisions are made on the basis of risk/benefit analysis (e.g. environmental decisions, mining reclamation, use of fossil fuels)
- _____ Recognize the importance of repeatability of results and collecting sufficient data for a generalization to be made by the scientific community.

STANDARD B

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

- _____ *Describe the important contributions of different ethnic and gender groups to science and technology.
- _____ *Identify science-related careers and the skills/education needed for them.
- _____ *Investigate a program (e.g. recycling, protecting endangered animals, alternative fuels) and describe the costs and benefits.
- _____ Analyze the effects of policies on a local science and technology issue (e.g. decisions about landfills, water quality, energy use).
- _____ Identify how the advancement of science is related to the benefits and liabilities of environmental and societal issues.