

**CARTERVILLE SCHOOL DISTRICT**  
**SCIENCE CURRICULUM**  
**GRADE 8**  
*Revised 2009*

The following Inquiry Skills will be taught throughout the year.

- ❑ Identify the three main branches of Science as Earth, Life and Physical Science.
- ❑ Identify and describe the skills that scientists use.
- ❑ Identify the problem solving steps of the Scientific Method.
- ❑ Describe the importance of hypotheses and controlled experiments.
- ❑ Formulate a hypothesis.
- ❑ Conduct scientific experiments, distinguishing between control and manipulated variables.
- ❑ Design and conduct an original scientific experiment.
- ❑ Explain the difference between the scientist's use of the word "theory", and the use of the word in casual conversation.
- ❑ Name the International System of Units for length, mass, volume, and temperature.
- ❑ Collect and record data accurately using the metric system.
- ❑ Identify three types of graphs and explain the ways in which they are used.
- ❑ Organize data into charts, graphs, etc.
- ❑ Collect various measurements & differentiate between the units.

**FIRST QUARTER**

- ❑ Identify the units of a calendar.
- ❑ Describe two early ideas about the structure of the universe.
- ❑ Explain methods by which scientists study the universe.
- ❑ Compare size and scale in the universe and explain indicators that suggest the universe is expanding.

- ❑ Describe the properties and life cycles of stars.
- ❑ Identify types of galaxies and describe the contents and characteristics of galaxies.
- ❑ Describe and explain the evidence used to support the big bang theory.
- ❑ Describe the structure and age of the universe.
- ❑ Describe how the solar system formed.
- ❑ Describe the structure, composition and energy generating processes of the sun.
- ❑ Explain how the surface activity of the sun affects the Earth.
- ❑ Describe the formation and structure of the solid Earth.
- ❑ Explain the development of the Earth's atmosphere, the influence of early life on the atmosphere, and how the oceans and continents formed.
- ❑ Explain the difference between rotation and revolution.
- ❑ Describe three laws of planetary motion.
- ❑ Describe how the planets in our solar system were discovered.
- ❑ List the planets in the order in which they orbit the sun.
- ❑ Describe three ways in which the inner planets and outer planets differ.
- ❑ Explain the difference between a planet's period of rotation and period of revolution, and the difference between prograde and retrograde rotation.
- ❑ Describe the individual characteristics of each planet.
- ❑ Identify the characteristics that make Earth suitable for life.
- ❑ Describe the current theory of the origin of Earth's moon.
- ❑ Explain what causes the phases of Earth's moon and the difference between a solar and lunar eclipse.
- ❑ Explain why comets, asteroids, and meteoroids are important to the study of the formation of the solar system.
- ❑ Explain how cosmic impacts may affect life on Earth.
- ❑ Identify the characteristics of a mineral.

- ❑ Describe the processes by which minerals form.
- ❑ Identify the properties of minerals and explain how minerals are identified.
- ❑ Describe the characteristics of gems and explain why their valued.
- ❑ Describe how minerals are used and identify useful elements within minerals.
- ❑ List the characteristics used to identify rocks.
- ❑ Identify and describe the three major rock groups.
- ❑ Describe how rocks in each of the three groups form.
- ❑ Describe the rock cycle and give examples of how rocks can change.

#### **SECOND QUARTER:**

- ❑ Identify examples of renewable and nonrenewable resources.
- ❑ Explain the advantages and disadvantages of using various nonrenewable resources, such as fossil fuels and nuclear energy.
- ❑ Compare and contrast energy resources considered inexhaustible versus renewable.
- ❑ Explain why inexhaustible and renewable energy resources are used less than nonrenewable resources.
- ❑ Explain what must be true for a mineral to be classified as an ore.
- ❑ Describe how market conditions can cause a mineral to lose value as an ore.
- ❑ Compare and contrast metallic and nonmetallic mineral resources.
- ❑ Identify five different land forms on the surface of the Earth.
- ❑ Explain how the surface of the Earth changes.
- ❑ Compare and contrast mechanical and chemical weathering.
- ❑ Identify the factors that cause mechanical versus chemical weathering.
- ❑ Explain how each type of weathering occurs.

- ❑ Describe the factors that affect the rate at which rock weathers.
- ❑ Describe the source of soil.
- ❑ Explain how the different properties affect plant growth.
- ❑ Describe how various climates affect soil.
- ❑ Describe important benefits that soil provides and four methods of preventing damage and loss.
- ❑ Explain shoreline, wind, and ice erosion and deposition.
- ❑ Explain the effect of gravity on erosion and deposition.
- ❑ Describe how streams and rivers shape the surface of the Earth.
- ❑ Explain how water moves through the water cycle.
- ❑ Describe a watershed.
- ❑ Explain three factors that affect the rate of stream erosion.
- ❑ Describe stream and river deposits.
- ❑ Identify and describe the location of the water table.
- ❑ Describe an aquifer, a spring and a well.
- ❑ Explain how caves and sinkholes form as a result of erosion and deposition.
- ❑ Identify two forms of water pollution and explain how the properties of water influence the health of a water system.
- ❑ Describe two ways that wastewater can be treated.
- ❑ Describe how water is used and how water can be conserved in industry, agriculture, and at home.
- ❑ List the major divisions of the global ocean.
- ❑ Identify the properties of ocean water.
- ❑ Describe the interactions between the ocean and the atmosphere.
- ❑ Describe the ocean floor.

- ❑ Identify three groups of marine life.
- ❑ Describe two main ocean environments and their associated ecological zones.
- ❑ Identify living and nonliving resources in the ocean.
- ❑ Explain the difference between point-source and nonpoint-source pollution.
- ❑ Describe what is being done to control ocean pollution.
- ❑ Compare and contrast the ocean's surface and deep currents.
- ❑ Explain how currents affect climate.
- ❑ Describe the effects of El Nino and how scientists study and predict the pattern of El Nino.
- ❑ Explain tides and their relationship with the Earth, sun, and moon.

### **THIRD QUARTER**

- ❑ List the characteristics of all living things.
- ❑ Explain why scientists organize living things into groups.
- ❑ Describe early classification systems.
- ❑ Name the seven levels of classification currently used by scientists.
- ❑ Name and describe the six kingdoms into which all organisms are grouped.
- ❑ Classify an organism into the correct kingdom based on its characteristics.
- ❑ Describe ways in which bacteria cells are different from all other cells.
- ❑ Identify the two kingdoms of bacteria and describe how bacteria reproduce and survive.
- ❑ Describe both the detrimental and positive roles that bacteria play in people's lives.
- ❑ Give reasons why viruses are considered to be nonliving.
- ❑ Describe the basic structure, sizes, and shapes of viruses.
- ❑ Explain how viruses multiply.

- ❑ Identify the levels of organization in the human body.
- ❑ Identify the 4 types of tissue in the human body.
- ❑ Define homeostasis and describe its importance.
- ❑ Distinguish between ligaments and tendons.
- ❑ Identify the functions of the skeletal system.
- ❑ Describe the structure of bones and how they grow and form.
- ❑ Distinguish between skeletal, smooth, and cardiac muscle and explain the function of each.
- ❑ Explain how skeletal muscles work in pairs.
- ❑ Identify and describe the functions of the major organs of digestion.
- ❑ Place the steps of digestion in the correct order.
- ❑ Identify the components of the circulatory system and describe their functions.
- ❑ Identify the components of blood and describe their functions.
- ❑ Make a graph representing the U.S. blood type distribution.
- ❑ Identify compatible blood donors.
- ❑ Identify the structures of the heart.
- ❑ Trace the pathway of blood through the heart.
- ❑ Identify the organs of respiration and describe their functions.
- ❑ Describe the mechanics of breathing.
- ❑ Identify the functions of the nervous system.
- ❑ Describe the structure of a neuron and explain how a nerve impulse travels.
- ❑ Identify the divisions of the nervous system and describe the respective parts.
- ❑ Name the senses and state the overall function performed by the senses and describe how each of the sense organs works.

- ❑ Identify major organ system disorders and list ways in which people can keep their organ systems healthy.

#### **FOURTH QUARTER**

- ❑ Identify and classify biotic and abiotic parts of an ecosystem.
- ❑ Explain how biotic and abiotic factors affect habitat, population density and the levels of organization in an ecosystem.
- ❑ Describe how ecologists determine the size of a population.
- ❑ Explain what factors cause populations to change in size and identify limiting factors.
- ❑ Explain the relationship between carrying capacity and limiting factors.
- ❑ Explain how an organism's adaptations help it to survive.
- ❑ Describe the energy roles of organisms in an ecosystem.
- ❑ Distinguish between food chains and food webs.
- ❑ Explain how energy flows through a food web.
- ❑ Describe how the removal of one species affects the entire food web.
- ❑ Describe the major types of interactions between organisms.
- ❑ Identify the factors that affect biodiversity.
- ❑ Explain the value of biodiversity.
- ❑ Name some of the human activities that threaten biodiversity.
- ❑ List some ways that biodiversity can be protected.
- ❑ Explain the difference between climate and weather.
- ❑ Describe how climate affects ecosystems and biomes.
- ❑ Describe ways in which climate can change over time.