

**CARTERVILLE SCHOOL DISTRICT  
SCIENCE CURRICULUM  
GRADE 7  
Revised August 2009**

The following Inquiry Skills will be taught throughout the year.

- ❑ Know that the three main branches of Science are Earth, Life and Physical Science.
- ❑ Identify and describe the skills scientists use.
- ❑ Know the steps of the Scientific Method.
- ❑ Describe three methods of investigation.
- ❑ Formulate a hypothesis.
- ❑ Conduct scientific experiments distinguishing between control and manipulated variables.
- ❑ Know and be able to use scientific process skills including observing, estimating, and measuring.
- ❑ Collect, report and display the results of individual and group investigations into charts, graphs, etc.
- ❑ Know the International System of Units for length, mass, and volume.
- ❑ Collect and record data accurately using the metric system.
- ❑ Collect mass and volume measurements.
- ❑ Explain the difference between mass and weight.
- ❑ Calculate area and density.
- ❑ Identify lab safety symbols, and demonstrate safe practices during lab investigations.
- ❑ Identify the benefits of science in the world.

## FIRST QUARTER

- ❑ Describe five jobs that use science.
- ❑ Explain how scientific knowledge can change.
- ❑ Give examples of three types of models and the benefits and limitations of each.
- ❑ Compare the ways that scientists use hypothesis, theories, and laws.
- ❑ Explain the process of diffusion.
- ❑ Describe how osmosis occurs.
- ❑ Compare passive transport with active transport.
- ❑ Describe and compare photosynthesis and cellular respiration.
- ❑ Compare cellular respiration with fermentation.
- ❑ Describe how cells reproduce by the process of mitosis.
- ❑ Explain how cell division differs in animals and plants.
- ❑ Describe how gas is exchanged in the leaves of plants.
- ❑ Describe two ways in which photosynthesis is important.
- ❑ Describe pollination and fertilization in flowering plants.
- ❑ Explain how fruits and seeds are formed from flowers.
- ❑ List three reasons why a seed might be dormant.
- ❑ Identify three examples of asexual reproduction in plants.
- ❑ Describe how plants respond to light, gravity, and changes of season.

## SECOND QUARTER

- ❑ Describe properties of matter.
- ❑ Identify how matter is measured in relation to mass and weight.
- ❑ Explain the relationship between mass and inertia.
- ❑ Identify six physical properties of matter.
- ❑ Describe how density is used to identify a substance.
- ❑ List six examples of physical changes and explain what happens to matter during these changes.
- ❑ Describe examples of chemical properties of matter.
- ❑ Explain what happens during a chemical change.
- ❑ Distinguish between physical and chemical changes.
- ❑ Understand that matter is made of particles called atoms and molecules.
- ❑ Describe the states of matter and distinguish between each state.
- ❑ Describe three factors that affect how gases behave.
- ❑ Understand the gas laws.
- ❑ Describe how energy is involved in changes of state.
- ❑ Describe what happens during melting and freezing.
- ❑ Compare evaporation and condensation.
- ❑ Explain what happens during sublimation.
- ❑ Describe the characteristics of elements.
- ❑ Explain how elements can be identified.
- ❑ Classify elements according to their properties.
- ❑ Explain how elements make up compounds.
- ❑ Describe the properties of compounds.
- ❑ Identify common compounds.

### THIRD QUARTER

- ❑ Describe mixtures.
- ❑ Describe four methods of separating the parts of a mixture.
- ❑ Explain how concentration affects a solution and analyze in terms of its solute and solvent.
- ❑ Compare and contrast colloids, solutions, and suspensions.
- ❑ Know the atomic theory and understand its history.
- ❑ Describe the size and parts of an atom.
- ❑ Describe the relationship between numbers of protons, neutrons, electrons, and atomic number.
- ❑ State how isotopes differ.
- ❑ Describe the force within an atom.
- ❑ Understand the history and organization of the periodic table.
- ❑ Identify 25 common elements and the symbols.
- ❑ Compare metals, nonmetals, and metalloids based on their properties and on their location in the periodic table.
- ❑ Describe the difference between a period and a group.
- ❑ Explain why elements in a group have similar properties and describe the properties of the groups of the current periodic table.
- ❑ Describe chemical bonding.
- ❑ Identify the number of valence electrons in an atom and predict whether an atom is likely to form bonds.
- ❑ Explain how ionic bonds form and why they are neutral.
- ❑ Describe how positive and negative ions form.
- ❑ Explain how covalent bonds occur.
- ❑ Describe the properties of metals and how metallic bonds form.

## FOURTH QUARTER

- ❑ Describe how chemical reactions produce new substances with new properties.
- ❑ Identify evidence of chemical reactions.
- ❑ Explain what happens to chemical bonds during a chemical reaction.
- ❑ Interpret and write simple chemical formulas.
- ❑ Balance simple chemical equations to show the law of conservation of mass.
- ❑ Describe and classify four types of chemical reactions.
- ❑ Compare endothermic and exothermic reactions.
- ❑ Explain activation energy.
- ❑ Describe five factors that affect the rate of a reaction.
- ❑ Describe the properties of ionic and covalent compounds and classify compounds based on their properties.
- ❑ Describe properties of acids and bases.
- ❑ Identify acids and bases by using the pH scale.
- ❑ Identify uses of both acids and bases.
- ❑ Describe the formation and uses of salts.
- ❑ Explain why there are so many organic compounds.
- ❑ Identify and describe saturated, unsaturated, and aromatic hydrocarbons.
- ❑ Describe the characteristics of carbohydrates, lipids, proteins, and nucleic acids and their functions in the body.
- ❑ Describe how radioactivity was discovered.
- ❑ Compare alpha, beta, and gamma decay.
- ❑ Compare nuclear fission to nuclear fusion and identify advantages of both.