

**RIDGECROFT SCHOOL
PHYSICAL SCIENCE**

PACING GUIDE

| TOPICS/CONCEPTS | TIME | CURRICULUM OBJECTIVES 1.01, 1.02, 1.03, 1.04, 1.05 | RESOURCE(S): EARTH SCIENCE (PUBLISHER: Glencoe) ISBN 0-07- 861700-6 SE |
|--|------|---|--|
| FIRST GRADING PERIOD | | | |
| SCIENCE SKILLS | 5 | | TEXTBOOK: Chapter 1 |
| PHYSICS <ul style="list-style-type: none"> • Motion • Forces and Motion • Forces in Fluids | 25 | 2.01, 2.02 | TEXTBOOK: Chapters 11, 12, 13 |
| 30 Days | | | |
| PHYSICS <ul style="list-style-type: none"> • Work, Power, and Machines • Energy • Thermal Energy and Heat | 30 | 2.01, 2.02, 3.01, 3.02, 3.03 | TEXTBOOK: Chapters 14, 15, 16 |
| THIRD GRADING PERIOD | | | |
| PHYSICS <ul style="list-style-type: none"> • Mechanical Waves and Sound • The electromagnetic Spectrum and Light • Optics | 25 | 3.04 | TEXTBOOK: Chapters 17, 18, 19 |
| REVIEW AND ASSESSMENT | 5 | | |
| FOURTH GRADING PERIOD | | | |
| ELECTRICITY <ul style="list-style-type: none"> • Charge • Circuits MAGNETISM <ul style="list-style-type: none"> • Magnets and Magnetic fields • Electromagnetism | 20 | 4.01, 4.02, 4.03 | TEXTBOOK: Chapters 20, 21 |
| CHEMISTRY <ul style="list-style-type: none"> • Properties of Matter | 10 | 2.01 | TEXTBOOK: Chapter 2 |
| FIFTH GRADING PERIOD | | | |
| CHEMISTRY <ul style="list-style-type: none"> • States of matter • Atomic Structure • The Periodic Table | 20 | 5.01, 5.02, 5.03, 6.01, 6.02, 6.03, 6.04, 6.06 | TEXTBOOK: Chapters 3, 4, 5 |
| CHEMISTRY <ul style="list-style-type: none"> • Chemical bonds • Chemical Reactions | 10 | 6.01, 6.02, 6.03, 6.04, 6.05 | TEXTBOOK: Chapters 6, 7 |
| SIXTH GRADING PERIOD | | | |
| CHEMISTRY <ul style="list-style-type: none"> • Solutions, Acids, and Bases • Carbon Chemistry • Nuclear Chemistry | 25 | 5.03, 6.05, 6.06 | TEXTBOOK: Chapters 8, 9, 10 |
| REVIEW AND ASSESSMENT | 5 | | |

8/1/06

NC STANDARD COURSE OF STUDY

The Physical Science curriculum is designed to continue the investigation of the physical sciences begun in earlier grades. The Physical Science course will build a rich knowledge base to provide a foundation for the continued study of science. The investigations should be approached in both a qualitative and quantitative manner in keeping with the developing mathematical skills of the students. The unifying concepts and program strands provide a context for teaching content and process skill goals. All goals should focus on the unifying concepts:

- Systems, Order and Organization
- Evidence, Models, and Explanation
- Constancy, Change, and Measurement
- Evolution and Equilibrium
- Form and Function

COMPETENCY GOAL 1: THE LEARNER WILL DEVELOP ABILITIES NECESSARY TO DO AND UNDERSTAND SCIENTIFIC INQUIRY.

- 1.01 Identify questions and problems that can be answered through scientific investigations.
- 1.02 Design and conduct scientific investigations to answer questions about the physical world.
- Create testable hypotheses
 - Identify variables.
 - Use a control or comparison group when appropriate.
 - Select and use appropriate measurement tools.
 - Collect and record data.
 - Organize data into charts and graphs.
 - Analyze and interpret data.
 - Communicate findings.
- 1.03 Formulate and revise scientific explanations and models using logic and evidence to:
- Explain observations.
 - Make inferences and predictions.
 - Explain the relationship between evidence and explanation.
- 1.04 Apply safety procedures in the laboratory and in field studies:
- Recognize and avoid potential hazards.
 - Safely manipulate materials and equipment needed for scientific investigations.
- 1.05 Analyze reports of scientific investigations from an informed scientifically literate viewpoint including considerations of:
- Appropriate sample.
 - Adequacy of experimental controls.
 - Replication of findings.
 - Alternative interpretations of the data.

COMPETENCY GOAL 2: THE LEARNER WILL CONSTRUCT AN UNDERSTANDING OF FORCES AND MOTION.

- 2.01 Measure and mathematically/graphically analyze motion:
- Frame of reference (all motion is relative - there is no motionless frame).
 - Uniform motion.
 - Acceleration.
- 2.02 Investigate and analyze forces as interactions that can change motion:
- In the absence of a force, an object in motion will remain in motion or an object at rest will remain at rest until acted on by an unbalanced force.
 - Change in motion of an object (acceleration) is directly proportional to the unbalanced outside force and inversely proportional to the mass.
 - Whenever one object exerts a force on another, an equal and opposite force is exerted by the second on the first.

COMPETENCY GOAL 3: THE LEARNER WILL ANALYZE ENERGY AND ITS CONSERVATION.

- 3.01 Investigate and analyze storage of energy:
- Kinetic energy.
 - Potential energies: gravitational, chemical, electrical, elastic, nuclear.
 - Thermal energy.
- 3.02 Investigate and analyze transfer of energy by work:

- Force.
- Distance.

3.03 Investigate and analyze transfer of energy by heating:

- Thermal energy flows from a higher to a lower temperature.
- Energy will not spontaneously flow from a lower temperature to a higher temperature.
- It is impossible to build a machine that does nothing but convert thermal energy into useful work.

3.04 Investigate and analyze the transfer of energy by waves:

- General characteristics of waves: amplitude, frequency, period, wavelength, velocity of propagation.
- Mechanical waves.
- Sound waves.
- Electromagnetic waves (radiation).

COMPETENCY GOAL 4: THE LEARNER WILL CONSTRUCT AN UNDERSTANDING OF ELECTRICITY AND MAGNETISM.

4.01 Investigate and analyze the nature of static electricity and the conservation of electrical charge:

- Positive and negative charges.
- Opposite charges attract and like charges repel.
- Analyze the electrical charging of objects due to the transfer of charge.

4.02 Investigate and analyze direct current electrical circuits:

- Ohm's law.
- Series circuits.
- Parallel circuits.

4.03 Investigate and analyze magnetism and the practical applications of the characteristics of magnets.

- Permanent magnets
- Electromagnetism
- Movement of electrical charges

COMPETENCY GOAL 5: THE LEARNER WILL BUILD AN UNDERSTANDING OF THE STRUCTURE AND PROPERTIES OF MATTER.

5.01 Develop an understanding of how scientific processes have led to the current atomic theory.

- Dalton's atomic theory.
- J.J. Thomson's model of the atom.
- Rutherford's gold foil experiment
- Bohr's planetary model.
- Electron cloud model.

5.02 Examine the nature of atomic structure:

- Protons.
- Neutrons.
- Electrons.
- Atomic mass.
- Atomic number.
- Isotopes.

5.03 Identify substances through the investigation of physical properties:

- Density.
- Melting point.
- Boiling point.

COMPETENCY GOAL 6: THE LEARNER WILL BUILD AN UNDERSTANDING OF REGULARITIES IN CHEMISTRY.

6.01 Analyze the periodic trends in the physical and chemical properties of elements.

- Groups (families).
- Periods.

6.02 Investigate and analyze the formation and nomenclature of simple inorganic compounds.

- Ionic bonds (including oxidation numbers).
- Covalent bonds.

- Metallic bonds.

6.03 Identify the reactants and products of chemical reactions and balance simple equations of various types:

- Single replacement.
- Double replacement.
- Decomposition.
- Synthesis.

6.04 Measure and analyze the indicators of chemical change including:

- Development of a gas.
- Formation of a precipitate.
- Release/absorption of energy (heat or light).

6.05 Investigate and analyze the properties and composition of solutions:

- Solubility curves.
- Concentration.
- Polarity.
- pH scale.
- Electrical conductivity.

6.06 Describe and explain radioactivity and its practical application as an alternative energy source:

- Alpha, beta, and gamma decay.
- Fission.
- Fusion.
- Nuclear waste.