

St. Clement's School
Course Outline
Eighth Grade Science
Fall Semester

This course outline is a general guide to familiarize students and parents with an overview of the course. It is an approximation of the content and objectives of the course for the fall semester. The rate of progress may vary depending upon the learning pace that the students can accomplish this semester.

I. Course content

A. First unit

1. Science and scientists
2. Scientific methods
3. Scientific models
4. Tools, measurement and safety
5. Learning objectives
 - a. Describe three methods of investigation
 - b. Identify science in the world around you
 - c. Describe jobs that use science
 - d. Identify steps in scientific method
 - e. Formulate a testable hypothesis
 - f. Explain how scientific methods answer questions and solve problems
 - g. Use models to represent the natural world
 - h. Identify limitations of models
 - i. Describe theories and laws
 - j. Collect, record and analyze information using various tools
 - k. Explain the importance of the International System of Units
 - l. Calculate area and density
 - m. Demonstrate safe lab practice

B. Second unit

1. Development of the atomic theory
2. The atom's structure
3. Learning objectives
 - a. Describe the work of scientists' experiments that led to the atomic theory
 - b. Compare the different models of atoms
 - c. Evaluate the impact of research on the atomic theory
 - d. Describe the parts and structure of an atom
 - e. Identify the properties of an atom including mass and electric charge
 - f. Calculate the number of particles in an atom using the atomic number, mass number and overall charge
 - g. Identifying isotopes

C. Third unit

1. Electrons and the periodic table
2. Grouping the elements by characteristics and periodic table location
3. Learning objectives
 - a. Describe how the structure and parts of an atom relate to an element's properties
 - b. Describe how electrons in an atom are arranged in energy levels
 - c. Use information about valence electrons to understand how elements are grouped on the periodic table
 - d. Use the structure of an atom to explain why elements in a group have similar properties
 - e. Interpret information on the periodic table to explain how physical properties are used to group elements

D. Fourth unit

1. Ionic compounds
2. Covalent compounds
3. Acids, bases and salts
4. Organic compounds
5. Learning objectives
 - a. Describe chemical bonding
 - b. Explain how atoms become ions
 - c. Describe how substances react through ionic bonding to form ionic compounds
 - d. Describe the properties of ionic compounds
 - e. Describe how substances react through covalent bonding to form covalent compounds
 - f. Describe the properties of covalent compounds
 - g. Describe how the physical and chemical properties of acids and bases determine their use
 - h. Explain the difference between strong and weak acids
 - i. Identify acids and bases through the pH scale
 - j. Describe how the physical and chemical properties of salts determine their use
 - k. Explain why so many organic compounds are possible
 - l. Describe and identify saturated, unsaturated and aromatic hydrocarbons
 - m. Identify how properties of plastic influence their application in every day material

E. Fifth unit - science project

1. Learning objectives
 - a. Select a topic for research
 - b. Research topic
 - c. Write research of note cards
 - d. Design and execute a 5 day experiment
 - e. Keep a log book

- f. Set up charts and graphs based on data
- g. Draw conclusions based on data
- h. Write an abstract
- i. Write a works cited page
- j. Peer edit research papers
- k. Design backboard &/or power point presentation
- l. Prepare a ten minute minimum oral presentation for the class

II. Grading

- A. Students are expected to demonstrate understanding of concepts
- B. Areas of evaluation
 - 1. Class participation
 - 2. Homework
 - 3. Labs
 - 4. Tests
 - 5. Notebook

III. Weighted grades

- A. Tests-40%
- B. Homework-10%
- C. Labs-30%
- D. Notebooks-20%
- E. Semester finals-25% of the semester grade

IV. Projects - third six weeks is devoted to learning how to set up science projects in class in preparation for high school curriculum

V. Class policies

- A. Materials
 - 1. Notebook
 - 2. Pen (black or blue) for tests and homework assignments
 - 3. Pocket folder for each six week period
 - 4. Metric ruler
 - 5. Colored pencils
 - 6. Graph paper
 - 7. Textbook
- B. Late work
 - 1. Work is due on the date assigned.
 - 2. Late work will not be accepted unless absent
- C. Absence
 - 1. If the student is absent, (s)he has the number of days absent to make up the with a five day limit.
 - 2. If on a planned trip, work is due on the day of return.
- D. Homework
 - 1. Homework is given a couple of times a week, but in no specific pattern
 - 2. Most work is done in class in the form of labs