

St. Clement's School
Course Outline
Seventh 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. Scientific method steps
2. Scientific model types
3. Metric measurement
4. Lab safety
5. Science in the news and everyday life
6. Learning objectives
 - a. Design an experiment
 - b. Make observations
 - c. Formulate and test hypothesis
 - d. Understand the difference between predictions and hypotheses
 - e. Identify control and variable
 - f. Collect data
 - g. Display data in a chart and graph format
 - h. Analyze results and draw conclusions
 - i. Verbally communicate results
 - j. Use models to represent the natural world
 - k. Know the limitations of models
 - l. Compare theory and law
 - m. Learn the use of metric measurement lab equipment
 - n. Debate the use of metric units in the U.S. and world
 - o. Calculate using metrics
 - p. Demonstrate safe practices in lab

C. Second unit

1. Chemical elements and their properties
2. Chemical compounds and their properties
3. Chemical mixtures
4. Chemical suspensions
5. Chemical colloids
6. Learning objectives
 - a. Describe a pure substance
 - b. Describe physical properties of elements
 - c. Observe and classify element samples
 - d. Identify compounds in your world
 - e. Make a concept map of elements' nutritional properties

- f. Learn to separate mixtures
- g. Explore concentrations in lab
- h. Learn to perform a flame test
- i. Calculate concentrations and percentages
- j. Differentiate between a solution, suspension and colloid
- k. Interpret graph on solubility
- l. Explain how elements can be identified
- m. Classify elements by their properties

D. Third unit

- 1. Introduction to the periodic table
- 2. Classifying elements
- 3. Learning objectives
 - a. Identify physical properties of elements and how they are used to arrange elements on the periodic table
 - b. Describe how the periodic table can be used to predict the properties of new elements
 - c. Identify the difference between a group and period
 - d. Design a periodic table of common objects
 - e. Learn to read the parts of the periodic table
 - f. Demonstrate chemical reaction in lab stations

E. Fourth unit

- 1. Gravity and motion
- 2. Newton's laws of motion
- 3. Learning objectives
 - a. Explain how gravity and air resistance affect falling object
 - b. Explain weightlessness
 - c. Describe orbit
 - d. Exhibit projectile motion
 - e. Calculate velocity of falling objects, momentum and acceleration
 - f. Design a parachute that will descend the slowest
 - g. Build a marshmallow catapult to demonstrate Newton's third law
 - h. Demonstrate inertia lab
 - i. Create scenario to demonstrate inertia, momentum and conservation of momentum
 - j. Choose a sport and tell five ways Newton's laws are involved in that sport

F. Fifth unit

- 1. Work and power
- 2. What is a machine and how does it make work easier
- 3. Simple machine types
- 4. Learning objectives
 - a. Determine when work is being done
 - b. Calculate work, power, mechanical efficiency and advantage problems

- c. Explain the difference between work and power
- d. Debate the pros and cons of machines
- e. Explain how machines make work easier
- f. Chart and graph the force-distance trade-off
- g. Demonstrate the basic relationships between force and motion using simple machines
- h. Identify class of lever, locate fulcrum, input force, output force and load
- i. Observe compound machines and determine what simple machines make them up
- j. Determine which wedge, screw, pulley, inclined plane and wheel and axle has the greater mechanical advantage
- k. Learn to operate a spring scale
- l. Design and build a compound machine. Demonstrate and explain its function

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. No major projects

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