

Course Title: Grade 6 Science

Tentative schedule for 2009-2010

General Overview: The Grade 6 Science Course is designed to encourage the enjoyment of science, to provide a foundation in science, to challenge students to think globally, and to become self-directed learners. The course is in alignment of the NYS standards and Buffalo Public School's curriculum for sixth grade. It incorporates some of the seventh grade life science NYS standards.

Goals:

- Develop and use experimental design in scientific inquiry
- Relate scientific concepts, skills, and processes to personal experience
- Use scientific language to communicate understanding
- Construct and interpret graphs and other graphic organizers
- Properly measure length, volume, mass, and temperature
- Develop an awareness and responsibility for the environment and its inhabitants

Internationalism will be emphasized throughout the year by studying the evolution of modern scientific thought through scientists from around the world including Aristotle, Hook, Mendel, Darwin, Linnaeus, Schleidin, Schwann, Leeuwenhoek, Bohr, Curie, Wagner, Watson, Crick, and others. Students will look at the universality of the scientific method, the periodic table and the metric measurement system.

September - November EXPERIMENTS WITH PLANTS

Standard 1: Scientific Inquiry (Key Ideas 1,2,3) and Standard 4: Living Environment (Key Ideas 1,4,5,6)

Description: Students review the parts and function of a plant while using the SQ3R method of note taking. Students learn about the scientific method and make a flip chart. They design and conduct controlled investigative experiments working in teams. Students execute their team experiments and collect data. Through data collection (qualitative and quantitative), measurement, observations and recording, students discover the effects of the manipulation of their chosen variable on the plants. Students reflect on their experiences by reviewing their recorded data, drawing conclusions, and deciding if they have answered their experimental questions. They communicate, in writing and orally, scientific information, procedures, and explanation to their classmates. Students explore energy flow and discover that materials such as carbon dioxide, nitrogen, and oxygen are constantly recycled.

Guiding Questions: What makes a good scientist? How can we behave, think, and problem solve like a scientist? How is scientific inquiry relayed to the international community? In what ways can scientific thought be organized? What is the interdependence of living things of the earth?

MYP Area of Interaction: Ingenuity and Approaches to Learning

Internationalism: Measure in metric and SI units, scientists and national background.

Assessment: Folder on plant experiment (background on plants, diagrams, observations, data gathered into charts, tables, conclusion and self-evaluation), response to questions, vocabulary in notebook (nb), note taking, diagrams of Water Cycle, Nitrogen Cycle, and Carbon Dioxide Cycle, measurement, safety procedures, work as part of a team, quizzes, diagrams, test, equations of photosynthesis and respiration.

October – November ENVIRONMENTAL CHANGES

Standard 4: The Living Environment (Key Idea 7: Human decisions and activities have had a profound impact on the physical and living environment.)

Description: Students learn about the earth's resources, impact of people on these resources, historical overview of conservative efforts in US.

Guiding Questions: How do people affect the Earth's resources? What resources do air, land, and water provide? How can you be a good steward of the Earth's resources at home and in the school community?

Areas of Interaction: Environments and Community and Service

Internationalism: Effects of human activity on the environment (Global Warming)

Assessment: Short responses to questions, note taking, vocabulary in nb, lesson assessments, Venn diagram, flip chart of resources from land, water, and air, poster to encourage recycling at CHS, persuasive essay on some point of view regarding the environment.

November EARTH PATTERNS AND CHANGES

Standard 4: The Physical Setting (Key Idea 2: Many of the phenomena that we observe on Earth involve interactions among components of air, water, and land.)

The Living Environment (Key Idea 7: Human decisions and activities have had a profound impact on the physical and living environment.)

Description: Students learn about the layers that form planet Earth, and the formation of mountains, earthquakes, and volcanoes. Students learn how plate movement creates changes on land and under the oceans. They review the rock cycle, how rocks are classified, and the formation of fossils. Students learn how water changes the earth's crust and how soil forms.

Guiding Questions: What changes occur within earth's layers? How do scientists explain the changes occurring within the earth? How do scientists monitor the changes within the earth? How do scientists connect to the international scientific community? What global advancements in technology have occurred to enable people to adapt to the changing earth (earthquakes)?

Areas of Interaction: Environments and Ingenuity

Internationalism: Wagner's Theory of Continental Drift, Communication within International scientific community, technological advancements.

Assessment: Short responses to questions, video summaries, note taking, vocabulary in nb, lesson assessments, Venn diagram comparing earthquakes and volcanoes, quizzes, and test.

December *Engineering Expressions will be presented to fifth and sixth graders by Civil Engineers of Western New York*

December- January STRUCTURE AND FUNCTION OF CELLS

Standard 4: The Living Environment (Key Idea1)

Description: Students learn how the microscope contributed to the understanding of the cell and explore the main points of cell theory. Explore the structure and function of cells; investigate how animal cells and plant cells differ.

Guiding Questions: How did scientists discover very small things? How does technology impact scientific thought? How does a scientist organize scientific thought?

Areas of Interaction: Ingenuity and Health and Social Education

Internationalism: Impact of scientific findings from around the world and throughout time

Assessment: Short responses to questions, note taking, vocabulary in nb, lesson assessments, use of microscope, quizzes, tests.

January MAGENTS AND MOTORS

Standard1: Scientific Inquiry (Key Idea 1, 2, 3) Physical Setting (Key Idea 4: Energy exists in many forms, and when these forms change energy is conserved. Key Idea 5: Energy and matter interact through forces that result in changes in motion.)

Description: Students will study energy, describe energy sources, production of energy, and identify transformation of energy. Through the Magnets and Motors kit, students will learn about the historical developments and uses of magnetism, electricity, and electromagnetism. Students will experiment with these phenomena in the same order that scientists first discovered them.

Guiding Questions: How can we think, behave, and problem solve like a scientist? How do scientists build from one another's ideas? What is the role of scientific communication in the evolution of scientific thought and understanding?

Areas of Interaction: Ingenuity Approaches to Learning

Internationalism: Timeline of scientists from around the world who were involved in the development of scientific thought regarding electricity and magnetism.

Assessment: Short responses to questions, note taking, vocabulary in nb, work as part of a team, form a hypothesis, select 1 variable, test, make observations and measurements, collect and gather data into charts and tables, interpret results, draw conclusion, work safely, self-evaluate, quizzes, and test.

February REPRODUCTION AND HEREDITY

Standard 4: The Living Environment (Key Idea 2 & 4)

Description: Students learn how cells reproduce and investigate how DNA carries information about an organism's traits.

Guiding Questions: **Areas of Interaction:** How do species change over time?

Internationalism: Human Genome Project

Assessment: Short responses to questions, note taking, vocabulary in nb, lesson assessments, flipchart of meiosis and mitosis, quizzes, test, design Punnett Square or pedigree chart.

February - March CHANGING AND ADAPTING

Standard 4: The Living Environment (Key Idea 3, 5, 6)

Description: Students identify basic life processes and learn that adaptations are traits that help organisms carry out these processes. Students explore how the fossil record shows that species have changed over

time. Students learn about the observations made by Charles Darwin that led to the theory of natural selection. Students explore how organisms respond to stimuli and how adaptations help them to survive.

Guiding Questions: What is the interdependence of living things of the earth? How do organisms change over time?

Areas of Interaction: Environments and Ingenuity

Internationalism: Impact of scientific thought communicated by scientists throughout the world, selective breeding, genetic engineering

Assessment: Short responses to questions, note taking, vocabulary in nb, video summaries, quizzes, tests.

March - May PHYSICAL SCIENCE

Standard: Physical Setting (Key Idea 3: Matter is made up of particles whose properties determine the observable characteristics of matter and its reactivity. Key Idea 4: Energy exists in many forms and when their forms change, energy is conserved.)

Description: Students will learn about matter, atoms, elements, compounds, and molecules. Students will examine periodic chart and begin to learn how elements are grouped. They will also learn about physical and chemical properties and discover how matter changes state, how solutions are formed, how chemical reactions are described and about the properties of acids and bases. Students will be writing lab reports.

Guiding Questions: How does matter change state? How does heat affect matter? What is heat? How do scientists build from one another's ideas? How can we behave, think, and problem solve like a scientist?

Areas of Interaction: Approaches to Learning, Ingenuity and Environment

Assessment: Short responses to questions, note taking, vocabulary in note book (nb), lesson assessments, video summaries, distinguish between chemical and physical changes, short responses to prompts about the periodic table and graphs, explorations of temperature and dissolving, experimenting with acids and bases, written lab reports, quizzes, tests, and self-evaluations.

May – June THE HUMAN BODY

Standard 4: The Living Environment (Key Idea 1, 4, 5)

Description: Students learn the structures and functions of the human body systems, including the nervous system and how the senses gather information. Students learn about the endocrine system and reproductive system. Students learn about the negative effects of tobacco, marijuana and alcohol on the body.

Guiding Questions: How is the body organized? What are the parts and function of each body system? How do the body systems work together? What are the best practices for maintaining a healthy body?

Areas of Interaction: Health and Social Education and Approaches to Learning

Internationalism: Assessment: Short responses to questions, note taking, lesson assessments, vocabulary in nb, video summaries, quizzes, tests, students will design a board game to be played and evaluated by fifth grade students on a human body system.

Requirements for Written Assignments:

Writing assignments are expected to be in final form when turned in and with the following components:

- Blue or black ink
- Double-spaced
- Neat and legible (if typed, 12 pt, Roman Times)
- Restate the question (If answering questions)
- Write in complete sentences legibly written/neatness counts
- Required margins on right and left side of paper
- Full heading with appropriate format (see below)
- Grammar and conventions appropriate for sixth grade
- Accompanying rubric should be attached

Format for Heading:

First and Last Name	HR/ID#
Subject	Date
Assignment Title and Page Number	

Assessment: Homework and Grading Practices and Descriptors

Grading will be based on student performance a variety of assessments, including quizzes, tests, writing assignments, observations, graphs, lab reports, models, diagrams, projects, journals, reflections, research, skill performances, and homework.

Quizzes are usually announced one or two days before date administered. Chapter and unit tests are announced at least 5 days before given. There are usually 2 -3 tests per marking period. Projects, reports and lab reports are usually graded with a rubric or grading guide.

Field Trip and Class Picnic:

Plan to go to Niagara Power Plant in Lewiston NY in May. Power Plant is free but there is a transportation fee. Will need about 10 parent volunteers to help chaperone. Details will follow.

Class picnic in June. Will need about 10 parent volunteers to help lead activities and chaperone.

Grading Practice

Each Marking Period

Quizzes & tests	40-50%
Homework	10-20%
Projects/written	10-20%
Journal./Labs	15-25%
Participation & Conduct	0-5%

Note a cumulative test will be given at the end of June and averaged into the fourth quarter grade. Students should retain tests as questions on the cumulative test will come from previous tests.

Grades: A 96-100 A- 94-95 B+ 92-93 B 90-91 B- 88-89

C+ 86-87 C 83-85 C- 80-82 D 75-79 F 74 and under

Homework is posted on the web (<http://www.buffaloschools.org/webpages/mjanowsky>). It is given for review and/or reinforcement of class work. Students should record assignments and upcoming tests in their planner. Homework may involve reading text, defining vocabulary, completing short response and studying. Projects and completion of experiments, investigation, labs and science journals are done at home. It is important to manage time so all deadlines can met. Assignments should be turned in the day after returning from an absence. After long illness, students should meet with teacher to schedule times to make up work.

Homework will be checked and given credit if completed neatly and thoroughly. No late assignments will be credited. Most of the time, assignments will be self-corrected in class; other times, assignments will be collected, corrected and graded by the teacher. This is to ensure that students do homework regularly, completely, and accurately.

Methods of Communication: Teacher can be reached through email (mjanowsky@buffaloschools.org) or a hand written note in student planner. Five-week progress reports will be sent to any student who has a grade of C or less or requested by parent or guardian.

Extra Help Opportunities: Students may come to me to schedule an appointment for extra help. Arrangements should be made for transportation.

Resources:

Science Grade 6, Scott Foresmans, 2003;
Science Horizon Grade 6
Life Sciences, Glencoe
Experiments with Plants- National Academy of Sciences
Magnets and Motors National Academy of Sciences

Flip Charts