

Science

Grade Level 6

Instructor name

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### Course Description

The sixth grade curriculum builds upon each student's scientific literacy and conceptual understanding of science ideas. The program's design focuses on those key concepts and practices all students should learn as identified in the National Science Standards. Unit studies provides ample opportunity for a student to work directly with science phenomena in physical sciences, life sciences, earth sciences, engineering, technology and applications of science. Each student is guided to discover and explore concepts and ideas through a series of hands-on investigations structured around investigative labs and related activities. The variety of topics reflect an explicit effort to utilize areas of interest a sixth grade student will find intrinsically appealing and relate to real life. Required readings develop and reinforce the work done in class by providing theoretical information on the "how and "why" of this science work or connecting to real world application.

### Learning Objectives and Benchmarks

Students will...

- Understand that scientific investigations usually involve the collection of relevant data, the use of logical reasoning, and the application of imagination in devising hypotheses and explanations to make sense of collected data.
- Gain an appreciation that when similar investigations give different results, the scientific challenge is to judge whether the differences are trivial or significant, and it often takes further studies to decide.
- Learn that if more than one variable changes at the same time in an experiment, the outcome of the experiment may not be clearly attributable to any one variable.
- Experience that collaboration among investigators can often lead to research designs that are able to deal with situations not possible when working alone.
- Learn that scientists know about the danger of prior expectations to objectivity and take steps to try and avoid it when designing investigations and examining data
- Become aware that important contributions to the advancement of science, mathematics, and technology have been made by different kinds of people, in different cultures, at different times.
- No matter who does science and mathematics or invents things, or when or where they do it, the knowledge and technology that result can eventually become available to everyone in the world.
- Develop a greater awareness that colleges and universities, business and industry, hospitals, and many government agencies employ scientists.
- Value technology's role as invaluable in science and mathematics because they speed up and extend people's ability to collect, store, compile, and analyze data; prepare research reports; and share data and ideas with investigators all over the world.
- Gain an appreciation for the fact that accurate record keeping, openness, and replication are essential for maintaining an investigator's credibility with other scientists and society.

## Benchmarks

1. Demonstrates an ability to understand, apply, and evaluate relevant science concepts and ideas.
2. Consistently applies active reading skills to acquire knowledge of scientific concepts.
3. Demonstrates an understanding of scientific inquiry and utilizes relevant process skills during scientific investigations.
4. Communicates understanding of scientific concepts, ideas and processes in a variety of ways.

## Preparation for Class/ Course Materials

Students resources - Life Science 1<sup>st</sup> Edition, *CPO, 2008*; Earth Science 1<sup>st</sup> Edition, *CPO, 2008*; Your 21st Century Brain by Michael A. DiSpenzio and Rob DeSalle 2010; Ocean, DK Science, 2005.

\*A wide variety of science curriculum and teacher generated materials are employed throughout the year to enrich the units of study.

## Methods of Instruction

The instructional practices in the sixth grade science lab involve a balance between teacher-facilitated and student-directed activities. These include direct lecture, individual and small group investigations, group discussions and research projects. Student work progresses through a logical sequence of related activities so that conceptual understanding is developed. Every effort is made to differentiate instruction based on a student's prior knowledge, experience, and learning style, thus determining the pace and depth of material presented. Assessments are designed to measure learning over time and to encourage increasing depth and sophistication of understanding.

## Special Note

Examples of how sixth grade science utilizes areas of interest that sixth graders find intrinsically appealing, as well as how science aligns with the other learning areas at various times throughout the year are listed below.

- A science and English connection is made through natural history writing activities.
- A science and art link occurs while introducing the use of observational drawing during scientific observations.
- Labs during the Brain and Learning unit include student dissection of a sheep's brain and cow's eye .
- Current research about the brain and learning is introduced during the above unit to help each student assess his/her learning style and identify appropriate study strategies based on this information.
- Students investigate food ecology during a sixth grade interdisciplinary study based on the book, Omnivor's Dilemma
- Student teams design and build nine-foot hot air balloons as the culminating project during their study of buoyancy, density and weather.

## Evaluation/Grading Procedures

A variety of tools are used to provide information on a student's knowledge and current learning. These include:

- Quality of responses in science spiral
- Daily teacher observations
- Homework (no more than 10% of total grade)
- Quizzes
- Investigations/ labs/performance tasks
- Ongoing assessments

\*Please refer to the Middle School Handbook for an explanation of the grading system used in 6th - 8th grades as well as the middle school's LATE WORK/ABSENCE policy.

## Projected Course Schedule

Class meets Monday, Wednesday and Friday, 46 to 50 minutes; Tuesday or Wednesday, 70 minutes, 2 semesters

Trimester 1 – Biodiversity; The Brain and Learning

Trimester 3 – Matter and the Forces of Fluid; Food Ecology

Trimester 3 - Ocean Science; Forces of motion