

School District of Waukesha Course Syllabus

Curriculum Area: Science		Course Length: Year
Course Title: Science 8		Course #: 1306
Prerequisites: Science 7		Date Last Revised: Sept. 2010
<p>Course Description and Purpose</p> <p>The middle school (6-8) curriculum is an activity based hands-on approach to the study of science. The students will be actively involved learning concepts in the areas of life, earth, and physical science. The general concepts of metric measurement, using measurement tools accurately, lab safety, and using the scientific method will be integrated into the units throughout the year. The learning targets at each grade level are based on the identified enduring understandings and essential questions. Common assessments will be used to determine student learning. Each grade level (6-8) will identify specific learning targets, but there will also be a progression of learning within the same science content areas. Students will build upon their learning from year to year. Each grade level will also incorporate different integrated activities that will emphasize group problem solving and real life applications of learning. Some examples of these activities could include: 6th grade camp experience, 7th grade Fox River measurement and biological survey, 8th grade Fox River Water Quality Assessment, 6-8th grade Gateway To Technology and robotics, and 8th grade Crime Scene Investigation. Students will be engaged in a wide variety of activities where they can connect science concepts and principles.</p>		
<p>Enduring Understanding(s):</p> <p>A. <u>Scientific Inquiry</u>- Students should investigate questions to develop an understanding of scientific ideas, and how scientists study the world.</p> <p>B. <u>Nature of Science</u>-Students will understand how science works, the processes of science, and how scientific knowledge has changed over time.</p> <p>C. <u>Systems and Energy</u>- Students will learn about how scientific systems work, and how the parts of these systems are related to the whole system.</p>		<p>Essential Questions</p> <p>A1. How can I investigate questions using the available resources and equipment? A2. How can I set up and use the appropriate equipment and technology to safely conduct an experiment? A3. How are accepted scientific models, theories and knowledge used to explain the results of my investigations? A4. How can I use technologies to present and communicate the results of an investigation?</p> <p>B1. What are the general rules of science and how are they used in science applications and investigations? B2. How have new scientific discoveries resulted in new technologies? B3. How are new scientific discoveries influencing currently accepted scientific theories? B4. What are the impacts of new scientific discoveries on human societies?</p> <p>C1. What role do cycles play in physical, earth, and the life sciences? C2. How do the interactions between matter and energy affect equilibrium of the science systems? C3. In what ways are science systems dependent on order and organization?</p>

D. Models and Scale-Students will use experimental models, simulations, and representations to understand ideas in science.

E. Patterns of Change-Students will recognize how change occurs in nature, society, and technology.

F. Form and Function-Students will understand the form and function of organisms and objects, and how these concepts are connected in the natural and designed world.

D1. How can I use models and representations to provide evidence of concepts in the physical, earth, and life sciences?

D2. How can I design investigations to test the usefulness of a scientific model?

E1. How can I identify changes that have been made in science that are based on new evidence that has been found?

E2. How can I use new scientific concepts and theories that are a result of new scientific discoveries?

E3. What are the impacts of science and technology on systems, the environment, and the quality of life.

F1. How can I use specific scientific technologies to solve problems?

F2. What are the connections between the form and functions of organisms in the natural world?

F3. How can I explain how local and global ecosystems have been changed as a result of technological innovations?

Learning Targets

1. Design and conduct an experiment using the scientific method.
2. Understand that there are unifying themes among scientific disciplines.
3. Take accurate measurements using appropriate instruments.
4. Use lab equipment in a safe manner.
5. Describe the organization and function of human organisms.
6. Use scientific evidence to explain earth's biological and geologic changes over time.
7. Give examples of the dynamic forces responsible for continued changes of the earth.
8. Demonstrate the difference between physical and chemical changes of matter.
9. Understand the relationship between atomic theory and the formation of molecules and compounds.
10. Describe the parts and properties of the electromagnetic energy spectrum.
11. Give examples of the three forms of heat transfer.
12. Describe the general structure of the solar system, galaxies, and the universe.
13. Understand that technology limits our understanding of the universe.
14. Explain the motion of objects using Newton's Laws.
15. Give examples of potential and kinetic energy and how they are related.
16. Communicate biotic and abiotic factors that affect a local watershed.
17. Understand that local resources affect the quality of life.
18. Use scientific information and skills to make informed decisions about the world.

Related Standards:

State Standards URL = <http://dpi.wi.gov/standards/sciintro.html>

Performance Assessment(s):

Laboratory Activities and common assessments for specific units of study including: human biology, chemistry, and geology.

Other Assessment(s):

Teacher made Assessments

Attach Course Common Assessment (Currently Under Construction)

Course Outline:

- I) Semester I
 - A. Scientific Method
 - 1. Measurement and lab techniques
 - 2. Lab safety
 - 3. Problem solving
 - B. Human Biology - Structure and function of living things
 - 1. The microscope review
 - 2. Cell specialization
 - 3. Organs
 - 4. Systems
 - C. Geology
 - 1. Rocks
 - 2. Minerals
 - 3. Earth's History
 - a. Geologic events
 - b. Life events
 - D. Properties of matter (Chemistry)
 - 1. Atomic theory and molecular theory review
 - 2. Mixtures
 - a. Solutions
 - b. Suspensions
 - 3. Families of elements
 - 4. Chemical interactions of elements
 - a. Chemical properties
 - b. Compound Formation
 - c. Properties of acids and bases/neutralizations
- II) Semester II
 - E. Transfer of energy (heat and light)
 - 1. Electromagnetic energy
 - a. Visible light
 - b. Heat energy
 - F. Astronomy
 - 1. Models of the universe
 - 2. Galaxies
 - 3. Solar System
 - a. Monthly and yearly cycles
 - 4. New discoveries
 - G. Motions and forces (mechanics)
 - 1. Newton's Laws of Motion
 - 2. Potential and kinetic energy
 - H. Water quality (Fox River Watershed)
 - 1. Human impact on Fox River Ecosystem

