



Course Title:	General Science
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Cycle/Division:	Middle School
Grade Level:	Grade 7
Credit Unit:	1
Duration:	2 semesters / 5 periods per week

Department's Vision:	Create Innovators who can link to life, with scientific understanding and learning.
Department's Mission:	Provide students with the proper knowledge, skills and scientific principles through hands on activities, research and experimentations, and thus creating young innovators who are ready for real life challenges and problem solving.

COURSE DESCRIPTION:

This course will deal with scientific reports in the 4 domains life, physical, chemical and earth sciences. It will introduce new topics and reinforce previous ones in addition to the scientific method and lab investigation skills. It will deal with topics such as cells, cell division, heredity, matter, chemical reactions and changes, circuits, motion calculations and descriptions, and last but not least plate tectonics and their effects, rock cycle, rock types and minerals.

General Academic Goals:

To cover the standards and benchmarks required by Michigan State for grade 7 in Science. To be ready to perform well in International exams assigned by the school. To be ready academically by the end of 2018-2019 for grade 8 in different fields of Science (Physical, Earth, and Life) involving investigation, experimentation, and research as their tools.

GENERAL SKILLS:

Evaluation skills: making judgment about knowledge by introducing new text to solve and tackle problems using the related knowledge taught.

Comprehension: given scientific text or diagrams to analyze and answer questions about, summarize, compare, relate, or experiment...

Communication and social skills: Making movies, ppt., projects, interviews, and presenting the work either individually or with a peer or as a group.

Investigative skills: lab work, research, journals, experimentation...

Mathematical skills: related to investigations in the lab and application in projects.

Technological skills used in science and computer labs.

Knowledge skills: list, define, show, demonstrate, invent, relate etc... using the taught concepts.

GENERAL COURSE LEARNING OBJECTIVES:

1. Explain how inheritance influences an organism's traits.
2. Describe how reproduction relates to genetic diversity.
3. Explain how genetic and environmental factors affect the growth and reproduction of plants.
4. Explain how an animal's behavior influences its reproductive success.
5. Explain ways to analyze data about substances before and after they interact to determine whether their identities have changed.
6. Explain how chemical equations model chemical reactions and demonstrate the law of conservation of matter.
7. Design, construct, and test a device that uses a chemical process to transfer thermal energy.
8. Explain how synthetic materials are designed and made to have properties that make them useful.
9. Describe how our use of synthetic materials impacts society.
10. Model and describe how unbalanced forces causes changes in motion.
11. Apply Newton's laws of motion to design a solution to a problem involving two colliding objects.
12. Analyze electromagnetic data to explain the interaction between electric and magnetic phenomena.
13. Model air circulation in Earth's atmosphere.
14. Use a model of ocean circulation to explain the flow of energy and the cycling of matter in Earth's oceans.
15. Learn how energy is involved in changing water's state.
16. Learn how water is constantly moving and cycling all over Earth.
17. Explain how scientists determine the ages of Earth's rocks and fossils.
18. Explain how evidence is used to organize Earth's history into the geologic time scale.
19. Describe how energy interacts with and changes objects.
20. Demonstrate that a transfer of energy to or from an object results in a change in the total energy of an object.



STANDARDS/BENCHMARKS:

- MS-LS1-4 Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.
- MS-LS1-5 Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.
- MS-LS3-2 Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.
- MS-PS1-2 Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
- MS-PS1-3 Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.
- MS-PS2-1 Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.
- MS-PS2-2 Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.
- MS-PS2-3 Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.
- MS-ETS1-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- MS-ESS2-4 Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
- MS-ESS2-6 Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.
- MS-ESS1-4 Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.
- MS-ESS2-3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.
- MS-PS3-2 Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.
- MS-PS3-5 Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.

RESOURCES:

Houghton Mifflin Harcourt (HMH) Science Dimensions book and online resources.
One Stop Planner, Linked Lesson presentations, Extended Visual Labs

You Tube movies
E-games and links
Teacher's Extended Handouts
Lab Handout

COURSE OUTLINE:

1. LIFE SCIENCES

Module B, Unit 3 – Reproduction, Heredity, and Growth.

- Lesson 1: Inheritance
- Lesson 2: Asexual and Sexual Reproduction
- Lesson 3: Plant Reproduction and Growth
- Lesson 4: Animal Reproduction and Growth

3. PHYSICAL /CHEMICAL SCIENCES

Module J, Unit 3 – Chemical and Processes and Equations

- Lesson 1: Chemical Reactions
- Lesson 2: Chemical Equations
- Lesson 3: Engineer it: Thermal Energy and Chemical Processes

Module J, Unit 4 – The Chemistry of Materials

- Lesson 1: Natural and Synthetic Materials
- Lesson 2: Engineer it: The Life Cycle of Synthetic Materials

3. PHYSICAL SCIENCES:

Module k, Unit 1 – Forces and Motion

- Lesson 3: Newton's Laws of Motion
- Lesson 4: Engineer it: Collisions between Objects

Module k, Unit 2 – Electric and Magnetic Forces

- Lesson 4: Electromagnetism

Module I, Unit 1 – Energy

- Lesson 1: Introduction to Energy (Handout/Worksheet only)

Module I, Unit 2 – Energy Transfer

- Lesson 1: Changes in Energy (Handout/Worksheet only)

4. EARTH SCIENCES

Module E, Unit 1 – Circulation of Earth's Air and Water

- Lesson 1: Circulation in Earth's atmosphere
- Lesson 2: Circulation in Earth's oceans
- Lesson 3: The Water Cycle

Module F, Unit 2 – Earth Through Time

- Lesson 1: The Age of Earth's Rocks
- Lesson 2: Earth's History

GRADING:

1. Quizzes /tests are given every other week as assigned by school. **Our tests and assessments** consist of multiple-choice, short answer, direct application problems, critical thinking situations, refer to figures, texts, graphs and/or open response items. They are aligned with Michigan benchmarks. A student failing any of his quizzes would have to sit for a **support class and retest** to achieve his 60% which is our passing mark. **A progress report is sent to the parent eventually after sitting for the make up exam.** 40 % is given to students that do not have a medical excuse for missing such an assessment.

2.Skill Based Assignments are done in class where a student has his resources all opened in front of him to answer a set of questions under verbal, nonverbal, quantitative, and spatial domains.

3. Research Sessions are done where students can debate as groups and check the internet for resources and answers to support their ideas. This kind of assessment is under **Research /Project/ Lab Sessions /Journals**. They are evaluated to info, creativity, presentation, discussion and relation to the subject.

4.Daily assessments and drop quizzes take place to check the understanding of students.

5. Laboratory work is checked for research, completeness, accuracy, understanding the experiment, group and individual reports and attendance with the lab coats. Every semester has one term practical assessment.

7. Projects are integrated across and assigned for every term. They are evaluated to accuracy, creativity, info and relation to the subject.

Grade Distribution:

SCIENCE DEPARTMENT GRADE DISTRIBUTION	
MIDDLE SCHOOL	
End of semester assessment	30%
Term Quizzes	20%
Skill based Assessment	5%
Project	10%
Research Journal	5%
Individual Lab Reports	5%
Group Lab reports	5%
Lab Practical Assessment	10%
MAP	5%
Drop Quizzes	5%

Cross-Curricular Project(s):

- Once per semester across the disciplines.
- Once as subject activity.