**Curriculum**

**7th Grade Integrated Science**

**Course 2**

**Course Overview**

The seventh grade course surveys topics from each of the traditional science disciplines- physical, life and earth- to show their interrelatedness. Units of study include: Atomic Structure, Chemical Bonds and Reactions, Chemistry of Food and Repsiration, Cell Division and Genetics, History of the Earth and Life Forms, and Evolution. At this level students are introduced to writing non-fiction science related papers including lab reports and biographies. During this course students continue to develop laboratory skills including measuring, problem solving, critical thinking and analyzing data. Students may be required to do one or more long term projects and research papers for the course.

**Department Standards**

**STANDARD 1: THE NATURE OF SCIENCE**

**STANDARD 2: SCIENCE AND TECHNOLOGY**

**STANDARD 3: THE PHYSICAL SETTING**

**STANDARD 4: THE LIVING ENVIRONMENT**

**STANDARD 5: SCIENCE AND SOCIETY**

**Benchmarks**:

[Science Department Standards & Benchmarks](http://acidale.on-rev.com/dante/Science/Standards&BenchmarksK-12.docx)

**Performance Indicators**

**Science 7**

**Performance Indicators**

**First Quarter**

Science Process Skills

-perform both qualitative and quantitative observations

-form hypothesis

Biology: Classification

-observe and identify defining characteristics of animals

-generate dichotomous key based on key characteristics

-interpret a dichotomous key to identify unknown organisms

Biology: cells and heredity

-analyse animal and plant cells under a microscope (3.1, 4.11, 4.13)

-summarize the work of a cell theorist and compare their work to contemporaries. (1.3, 1.5, 1.6, 1.8, 1.9, 1.10, 1.33 4.11)

-research and present information about the function of a particular organelle and how its structure enables its function (4.4, 4.16, 4.18)

-differentiate between active transport and passive transport (1.12, 1.19, 4.16,4.18)

-compare the role of aerobic (4.29) and anaerobic respiration in prokaryotic and eukaryotic cells.(4.16, 4.17, 4.24, 4.25)

-organize pictures of different stages of the cell cycle for both mitosis and meiosis. (4.6, 4.7, 4.9, 4.14)

-generate a diagram of the process of fertilization (4.8)

**Second Quarter**

Biology: genetics and evolution

-attribute adaptations to the survival of certain members of a species to reproduction age due to environmental changes and genetics (1.24.32, 4.33, 4.37)

-summarize the effect of selective breeding (4.10, 4.31)

-critique the theory of adaptation over time (1.3, 1.6, 1.8, 1.9)

**Third Quarter**

Atomic Structure and Chemical Bonding

-understand that matter is made of atoms (3.27)

-recognize atoms and elements (3.28, chemical elements, all compounds can be broken into about 100 elements 3.34)

-attribute elements to groups based on properties(3.35) such as different materials respond differently to electricity, temperature etc.(3.40)-Observe the physical characteristics of compounds to determine the type of chemical bonding.

-Generate models of simple inorganic molecules. (1.12)

**Fourth Quarter**

Chemistry and Chemical Reactions

-attribute coefficients based on balancing equations in order to demonstrate the law of conservation of matter (3.38, 3.39)

-single displacement, double displacement and oxidation reactions (3.36, 3.42, 3.43, 3.44)

-differentiate between heterogeneous and homogenous mixtures and identify the compounds and that form the mixtures including those that naturally and artificially occur (i.e. Earth’s atmosphere, ocean waters, or salad, alloys etc.) (3.15)-identify through its known properties if a substance is an acid or a base

-analyse pH indicators to determine the pH level of an unknown substance

Metric Measurement Skills

-record data including measurements in metric units for volume, temperature, mass, -convert between metric units from milli-kilo.

**Assessments**

**Science 7**

**Assessments**

Each quarter science journals are assessed using rubrics. Most days classes start with a warm-up/reflection on previous learning or open-ended question that sets up for inquiry about that day’s lesson objective.

**First Quarter**

Observe, Infer, Predict Poster

Science Method Test

Rubric graded Poster Display of self-selected group of 6 organisms with self-generated dichotomous key

Quiz on parts of the microscope.

Microscope “e” Lab

Microscope lab of plants and animals

Organelle Tea Party

Test on cell structures and functions

**Second Quarter**

Lab Report on Diffusion

Test on Cell Processes

Onion Root Tip Lab (Mitosis)

Modeling Meiosis

Quiz on Mitosis and Meiosis

DNA models

On-line lab of RNA synthesis

Test on Cell Reproduction

Heredity Labs (Punnet squares)

Pedigree Lab

Cumulative Test Second Semester

**Third Quarter**

Timeline of Atomic Theory

Test Atomic Structure

Element Advert

Group presentations of physical and chemical properties from Groups on the periodic table.

Lab on physical and chemical properties of covalent and ionic compounds

Lab covalent vs. ionic bonds (modelling compound formation)

**Fourth Quarter**

Labs on different types of chemical reactions

Lab Report (3 Types of reactions)

Quizzes

Tests on Types of Chemical Reactions

Acid and Base webquest

Red Cabbage Juice Lab

Lab on acids vs. bases and universal indicators

Metric World

Cumulative Test

**Core Topics**

**First Quarter**

Science Process Skills

Biology: Classification

Biology: Cell’s Structure and Function

**Second Quarter**Biology: Cell Reproduction

Biology: Genetics

Biology: Adaptations over Time

**Third Quarter**

Atomic Structure

Chemical Bonding

**Fourth Quarter**

Chemistry

Chemical Reactions

Acids and Bases

**Specific Content**

**First Quarter**

Science Process Skills

Classification of Animals

Dichotomous Keys

Microscope anatomy

Cell Theory

Plant vs. Animal cells: structures and functions of cells.

**Second Quarter**

Cell processes- metabolism and photosynthesis

Meiosis and Mitosis

DNA

Genetics and Genetic Engineering

Evolution: adaptations over time

**Third Quarter**

Atomic Theory and Structure

Elements and Periodic Table

Compounds (3.28, 3.34)

**Fourth Quarter**

Chemical formula and equations

Chemical Reactions (3.42, 3.43, 3.44)

Acids and Bases

SI Units of Measure

**Resources**

**Science 7**

**Resources**

**First Quarter**

Inquiry Skills Activities Book 2, Pearsons 2012

Chapter 1 lessons 2 and 3, Textbook F, Glencoe iScience textbook series, 2012 “Life’s Structure and Function”

Chapter 2, TextBook F, Glencoe iScience textbook series, 2012 “Life’s Structure and Function”

Websites and Videos

LMS Resources Folders: Unit 1 and Unit 2

brainpop.com

https://www.centreofthecell.org/learn-play/

https://app.discoveryeducation.com/

**Second Quarter**

Chapter 3, Textbook F, Glencoe iScience textbook series, 2012 “Life’s Structure and Function.”

Chapter 4, Textbook F, Glencoe iScience textbook series, 2012 “Life’s Structure and Function.”

Chapter 5, Textbook F, Glencoe iScience textbook series, 2012 “Life’s Structure and Function.”

Chapter 6 lesson 2, Textbook F, Glencoe iScience textbook series, 2012 “Life’s Structure and Function”

*Websites and Videos:*

LMS Resource Folders: Unit 3b and Unit 3c, Unit 4 Resource Folder

brainpop.com

https://www.centreofthecell.org/learn-play/

https://app.discoveryeducation.com/

Cell Division

Biology Essentials Series: Cells: The Building Blocks of Life

**Third Quarter**

Chapter 9, Textbook M, Glencoe iScience textbook series, 2012, “Atoms and Elements.”

Chapter 10, Textbook M, Glencoe iScience textbook series, 2012, “Atoms and Elements.”

Chapter 11, Textbook M, Glencoe iScience textbook series, 2012, “Atoms and Elements.”

*Websites and Videos:*

LMS Resources: Unit 5

Brainpop.com

History of the Atom part 2

Atoms and their electrons

http://www.chemeddl.org/resources/ptl/

**Fourth Quarter**

Chapters 12 Textbook N, "Interactions of Matter" Glencoe iScience 2012

Chapters 13, Textbook N, "Interactions of Matter" Glencoe iScience 2012

*Websites and Videos:*

Brainpop.com

LMS Resources Folders: Unit 6a and Unit 6b

Education with Vision: Acids and Bases in the home