Life Science

Ivy Collegiate School

2020-2021

Department:	Science	**Time:**	MTuW 13:00 – 14:00
Email:	science@ivycollegiateschool.org	**Place:**	808.

Course References: This is a list of various interesting and useful books and online resources that were used in the construction of the course. You are not required to purchase all of these (only those noted as such), but they may be useful for occasional consultation. (Note: They are available in the restricted library.)

- *Glencoe Life iScience*, McGraw-Hill, 2012. REQUIRED
- *Glencoe Life iScience: Reading Essentials, An Interactive Student Workbook*, McGraw-Hill, 2012. (An online copy may be found at: http://www.glencoe.com/sites/florida/student/science/assets/pdfs/glsre2.pdf)
- *Glencoe Life iScience: Student Notebook*, McGraw-Hill, 2012. (An online copy may be found at: http://www.glencoe.com/sites/florida/student/science/assets/pdfs/glssn2.pdf)
- *BioBuilder*, online resource, https://biobuilder.org/
- *Concord Consortium*, online resource, https://concord.org/

Objectives: This is a middle school introductory science course that introduces students to the concepts, practices, and principles of the biological sciences. Students begin by learning about life's smallest units and their mechanisms of reproduction and inheritance before moving on to a study of plant and animal diversity. In the fourth unit, students learn about human body systems and processes. The last unit of the course covers ecology and conservation biology. This is both a lab and classroom based course, requiring students to keep both a study notebook and a lab journal. The course will introduce students to writing in the sciences and the basic principles of scientific research. Students who are successful in this course will be well-prepared to take the next course in the ICS life sciences sequence: Biology I.

- UNIT #1: Life: Structure & Function
- UNIT #2: Bacteria to Plants
- UNIT #3: Animals
- UNIT #4: Human Body Systems
- UNIT #5: Interactions of Life

Co-/Prerequisites: N/A.

Science Projects: The Science Project is your opportunity to showcase what you have learned in the course and the skills that you have mastered. Students will choose a unique topic and develop a presentation, model, lab experiment, or video project that demonstrates a concept or research related to the life sciences. More information will be available in the Spring semester.

Life Science Course Outline:

- Week One ..... The scientific method
  - Measurement & scientific tools
  - Writing a science report (WORKSHOP)
- Week Two ..... Classifying & exploring life (U1)
  - Characteristics of life
  - Classifying organisms
  - Exploring life
- Week Three ..... Cell structure & function (U1)
  - The cell
  - Cellular transport
  - Cells & energy
  - Bean seeds (LAB)
- Week Four ..... From cells to organisms (U1)
  - The cell cycle & cellular division
  - Levels of organization
- Week Five ..... Reproduction of organisms (U1)
  - Sexual reproduction & meiosis
  - Asexual reproduction
- Week Six ..... Genetics (U1)
  - Mendelian inheritance
  - Punnett squares
  - DNA & genetics
  - DNA simulation (LabXchange)
- Week Seven ..... Evolution (U1)
  - Fossil evidence
  - Natural selection
  - Adaptations
  - Natural selection simulation (PhET)
- Week Eight ..... UNIT ONE REVIEW & TEST
- Week Nine ..... Bacteria & viruses (U2)
  - Bacteria
  - Viruses
  - Bacteria in a bottle (LAB)
- Week Ten ..... Protists & fungi (U2)
  - Protists
  - Fungi
- Week Eleven ..... Plant diversity (U2)
  - Seedless plants
  - Seed plants
  - Soil mixture (LAB)
- Week Twelve ..... Plant processes & reproduction (U2)
  - Energy processing in plants
  - Plant responses
  - Plant reproduction
- Week Thirteen ..... UNIT TWO REVIEW & TEST
- Week Fourteen ..... Animal diversity (U3)
  - Invertebrate phyla
  - Phylum chordata

- Week Fifteen ..... Animal structure & function (U3)
  - Support, control, movement
  - Circulation & gas exchange
  - Digestion & excretion
  - Oxygen transport (LAB)
- Week Sixteen ..... Animal behavior & reproduction (U3)
  - Animal behavior
  - Animal reproduction & development
- Week Seventeen ..... UNIT THREE REVIEW & TEST
- Week Eighteen ..... Structure & movement (U4)
  - Skeletal system
  - Muscular system
  - Skin
- Week Nineteen ..... Digestion & excretion (U4)
  - Nutrition
  - The digestive system
  - The excretory system
  - Sugar dissolution (LAB)
- Week Twenty ..... Respiration & circulation (U4)
  - Respiratory system
  - Circulatory system
  - Lymphatic system
  - How to measure blood pressure (WORKSHOP)
- Week Twenty-one ..... Immunity & disease (U4)
  - Diseases
  - Immune system
  - Preventing infections simulation (Lifeology)
- Week Twenty-two ..... Control & coordination (U4)
  - Nervous system
  - Endocrine system
- Week Twenty-three ..... Reproduction & development (U4)
  - Reproductive system
  - Human growth & development
- Week Twenty-four ..... UNIT FOUR REVIEW & TEST
- Week Twenty-five ..... Matter & energy in the environment (U5)
  - Abiotic factors
  - Cycles of matter
  - Energy in ecosystems
  - Modeling rain (LAB)
- Week Twenty-six ..... Populations & communities (U5)
  - Populations
  - Communities
- Week Twenty-seven ..... Biomes & ecosystems (U5)
  - Land biomes
  - Aquatic ecosystems
- Week Twenty-eight ..... Natural resources (U5)
  - Earth's resources
  - Pollution
  - Conservation
  - Factors that affect air quality simulation (Concord Consortium)

Week Twenty-nine ..... UNIT FIVE REVIEW & TEST
Week Thirty to Thirty-two ..... SPRING REVIEW PERIOD
Week Thirty-three to Thirty-six ..... SCIENCE PROJECTS
Week Thirty-seven ..... SCIENCE PROJECT PRESENTATIONS
Week Thirty-eight ..... FINALS

Grading Policy: Homework and quizzes (60%), Finals and Project (40%)

Important Dates:

Final Examination, Semester I ..... Dec 22, 2020
Final Examination, Semester II ..... Jun ?, 2021
Science Project Deadline ..... TBD

Course Policy:

- Students must submit a daily notebook, worked exercises, and keep a lab journal for review.

Class Policy:

- Regular attendance is essential and expected.
- All assignments should be submitted on time and with work shown.

Academic Honesty: Students are expected to abide by the policies regarding Academic Honesty as laid out in the ICS Student Handbook. Any violations will be forwarded for administrative review and the possible imposition of academic penalties.