

## Wilson Area School District Planned Course Guide

**Title of Planned Course:** Honors Biology

**Subject Area:** Science

**Grade Level:** 9

**Course Description:** This course is designed to include a detailed study of living things, their relationships to each other, to man, and to the environment. Complex biochemical processes will be examined and analyzed. There will also be an emphasis on laboratory assignments, which promote the scientific method and achieve a broader understanding of the similarities and differences of the structure and function of organisms.

**Time/Credit for this Course:** One Full Academic Year / 1.2 Credit

**Curriculum Writing Committee:** Wendy Baltz, Jennifer Burd, Ashley White

## Wilson Area School District Planned Course Materials

**Course Title:** Honors Biology

**Textbook:** Biology Prentice Hall  
Pearson Education, Inc.  
2010  
<http://www.prenticehall.com/>

**Teacher Resources:**

- Ancillary Materials including PowerPoints
- Study Island

# Curriculum Map

## **Weeks 1 & 2:**

The Science of Biology

- What is Science?
- Scientific Method
- Characteristics of Life
- Tools and Procedures

## **Weeks 3 & 4**

Chemistry of Life

- Properties of Water
- Carbon Compounds

## **Weeks 5 & 6**

Chemistry of Life

- Carbon Compounds
- Chemical Reactions - Enzymes

## **Weeks 7 & 8**

Chemistry of Life

- Carbon Compounds
- Chemical Reactions - Enzymes
- Transition to Cells

## **Weeks 9 & 10**

Cells

- Cell Theory and History
- Cell Structure and Functions
- Cell Transport

## **Weeks 11 & 12**

Cells

- Cell Structure and Functions
- Cell Transport

## **Weeks 13 & 14**

Photosynthesis

- ATP
- Overview of Photosynthesis
- Reactions of Photosynthesis

Cellular Respiration

- Chemical Pathways
- Krebs Cycle and Electron Transport

**Weeks 15 & 16**

Cell Growth and Division

- Cell Growth
- Cell Division (Mitosis)
- Regulating Cell Cycle
- Meiosis

**Weeks 17 & 18**

DNA and RNA

- History and Structure of DNA
- Replication
- Transcription and Translation

**Weeks 19 & 20**

DNA and RNA

- Mutations
- Gene Regulation
- Biotechnology

**Weeks 21 & 22**

Genetics

- Introduction to Genetics
- Punnett Squares

**Weeks 23 & 24**

Genetics

- Mendelian Genetics
- Linkage and Gene Maps

**Weeks 25 & 26**

Genetics

- Human Heredity
- Pedigrees

**Weeks 27 & 28**

Evolution

- Puzzle of the diversity of Life
- Darwin's Theory of Evolution
- Genes and Variation
- Evolution and Genetic Change
- Speciation
- Patterns of Evolution

**Weeks 29 & 30**

Ecology

- What is Ecology?
- Energy Flow
- Cycles of Matter
- What Shapes an Ecosystem?  
    Biotic and Abiotic Factors, Relationships, Succession
- Land Biomes

**Weeks 31 & 32**

Populations

- How Populations Grow
- Limits to Growth

Humans in the Biosphere

- A Changing Landscape
- Renewable and Nonrenewable Resources
- Biodiversity

**Weeks 33 & 34**

- Content Review
- Keystone Exam

**Weeks 35 and 36** (Time Permitting depending on date of Keystone Exam)

Classification

- Historical Classification
- Modern Evolutionary Classification
- Kingdoms and Domains

Plant Kingdom

- Classification and Diversity
- Plant Structures and Functions
- Plant Reproduction

Microorganisms

- Introduction to Bacteria
- Introduction to Viruses

## Curriculum Scope and Sequence

**Planned Course:** Honors Biology

**Unit:** The Science of Biology

**Time frame:** 5 Days

**State Standards:** 3.1.10A, 3.1.10.E, 3.2.10.A, 3.2.10.B, 3.2.10.D, 3.7.10B, 3.8.10B, 4.3.10.B

**Anchor(s) or adopted anchor:** S11.A.1.1.1-5, S11.A.1.2.1-2, S11.A.2.1.1-5, S11.A.2.2.1-2

**Essential content/objectives:** At end of the unit, students will be able to:

- Explain what the goal of science is and what a hypothesis is.
- Describe and apply the steps of the scientific method.
- Describe how scientists test hypotheses.
- Explain how a scientific theory develops.
- Explain the characteristics of living things.
- Explain how life can be studied at multiple levels.
- Use and apply the metric system.
- Appropriately use a compound light microscope.
- Describe common laboratory techniques
- Learn and apply safety techniques in the laboratory.

**Core Activities:** Students will complete/participate in the following:

- Outline chapter
- Chapter Worksheets
- Cricket Lab - Scientific Method
- What is Life? Lab
- Microscope Lab
- Graphing Activities
- Measurement and Factor/Label Worksheets

**Extensions:**

- Study Island
- Additional Graphing or Data Interpretation Activities
- Detailed Microscopic Studies

**Remediation:**

- Study Island
- Review Quizzes
- Review Worksheets
- Peer Tutoring

**Instructional Methods:**

- Direct instruction using notes and key terms
- Cooperative Learning during labs
- Group Discussion
- Teacher modeling and visual aids
- Independent Student Work

**Materials & Resources:**

- Textbook
- Worksheets
- PowerPoints
- Overheads
- Lab Materials

**Assessments:**

- Quizzes
- Tests
- Homework
- Student Participation
- Labs
- Questioning

## Curriculum Scope and Sequence

**Planned Course:** Honors Biology

**Unit:** Properties of Water and Organic Molecules

**Time frame:** 12 Days

**State Standards:** 3.1.10C, 3.1.10E, 4.8.10A, 3.1.10A, 4.3.10.C, 3.2.10.B, 4.6.10.A, 4.7.10B

**Anchor(s) or adopted anchor:** S11.A.1.3.2-3, S11.A.3.1.2, S11.A.3.3.1, S11.B.1.1.1-2

**Essential content/objectives:** At end of the unit, students will be able to:

- List and explain the properties of water.
- Explain why water molecules are polar.
- Differentiate between solutions and suspensions.
- Explain the difference between acidic and basic solutions.
- Describe the structure and function of each group of organic compounds.
- Explain how chemical reactions affect chemical bonds in compounds.
- Describe how energy changes affect how easily a chemical reaction will occur.
- Explain why enzymes are important to living things.

**Core Activities:** Students will complete/participate in the following:

- Outline chapter
- Chapter Worksheets
- Organic Molecule Chart
- Properties of Water Lab
- Acid and Base Lab
- Organic Food Lab
- Pineapple/Jello Activity
- Catalase Lab – Formal Lab Report
- Energy Activity
- Review Game

**Extensions:**

- Study Island
- Independent Research on Important Enzymes
- Build Molecular Models using model kits

**Remediation:**

- Study Island
- Review Quizzes
- Review Worksheets
- Peer Tutoring
- Chapter Review Packet



**Instructional Methods:**

- Direct instruction using notes and key terms
- Cooperative Learning during labs
- Group Discussion
- Teacher modeling and visual aids
- Independent Student Work
- Demonstrations

**Materials & Resources:**

- Textbook
- Worksheets
- PowerPoints
- Overheads
- Lab Materials
- Model Kits

**Assessments:**

- Quizzes
- Tests
- Homework
- Student Participation
- Labs
- Questioning

## Curriculum Scope and Sequence

**Planned Course:** Honors Biology

**Unit:** Ecology

**Time frame:** 4 Days

**State Standards:** 3.2.10.A, 4.3.10.B, 3.1.10.C, 3.1.10E, 4.8.10.A , 3.1.10.A, 4.3.10C, 3.2.10.B, 4.3.10.C, 4.6.10A, 4.2.10D, 4.3.10B, 4.2.10C, 4.4.10.C, 3.8.10C

**Anchor(s) or adopted anchor:** S11.A.1.2.1-2, S11.A.1.3.1-4, S11.A.3.1.1-4, S11.A.3.3.1, S11.B.3.1.1-5, S11.B.3.2.1-3, S11.B.3.3.1-2

**Essential content/objectives:** At end of the unit, students will be able to:

- Identify the levels of organization that ecologists study.
- Trace the flow of energy through living systems.
- Evaluate the efficiency of energy transfer among organisms in an ecosystem.
- Describe how matter cycles through the living and nonliving parts of an ecosystem.
- Describe how the availability of nutrients affects the productivity of an ecosystem.
- Explain how biotic and abiotic factors influence an ecosystem.
- Identify interactions that occur within communities.
- Explain the process of succession.
- Identify the characteristics of major land biomes.

**Core Activities:** Students will complete/participate in the following:

- Outline chapter
- Chapter Worksheets
- Practice Food Webs
- Activity to identify relationships between organisms
- Complete a biome chart
- Biome Slideshow or Biome Project

**Extensions:**

- Study Island
- Food Web Project
- Biome Project

**Remediation:**

- Study Island
- Review Quizzes
- Review Worksheets
- Peer Tutoring
- Chapter Review Packet

**Instructional Methods:**

- Direct instruction using notes and key terms
- Cooperative Learning during labs
- Group Discussion
- Teacher modeling and visual aids
- Independent Student Work

**Materials & Resources:**

- Textbook
- Worksheets
- PowerPoints
- Overheads
- Strange Days on Planet Earth – Predators video

**Assessments:**

- Quizzes
- Tests
- Homework
- Student Participation
- Labs
- Questioning
- Projects

## Curriculum Scope and Sequence

**Planned Course:** Honors Biology

**Unit:** Populations

**Time frame:** 4 Days

**State Standards:** 3.2.10A, 4.3.10B, 3.1.10.A, 3.1.10E, 4.3.10.C, 3.1.10B, 4.1.10.B, 4.6.10A, 3.1.10.C, 3.2.10.B, 4.2.10.D, 4.3.10.B,

**Anchor(s) or adopted anchor:** S11.A.1.2.1-2, S11.A.3.1.2, S11.A.3.2.1-2, S11.A.3.3.1-3, S11.B.3.1.1, S11.B.3.1.3, S11.B.3.1.5, S11.B.3.2.1-3

**Essential content/objectives:** At end of the unit, students will be able to:

- List the characteristics used to describe a population.
- Identify the factors that affect population size.
- Differentiate between exponential and logistic growth.
- Identify factors that limit population growth.
- Differentiate between density dependent and density independent limiting factors.

**Core Activities:** Students will complete/participate in the following:

- Outline chapter
- Chapter Worksheets
- Invasive Species Chart
- Predator/Prey Graphing activity
- Kaibab Lab
- Discuss the connection between lynx and hare populations.

**Extensions:**

- Study Island
- Research population growth of a species to determine if they should be protected

**Remediation:**

- Study Island
- Review Quizzes
- Review Worksheets
- Peer Tutoring

**Instructional Methods:**

- Direct instruction using notes and key terms
- Cooperative Learning during labs
- Group Discussion
- Teacher modeling and visual aids
- Independent Student Work

**Materials & Resources:**

- Textbook
- Worksheets
- PowerPoints
- Overheads

**Assessments:**

- Quizzes
- Tests
- Homework
- Student Participation
- Labs
- Questioning

## Curriculum Scope and Sequence

**Planned Course:** Honors Biology

**Unit:** Humans in the Biosphere

**Time frame:** 2 Days

**State Standards:** 3.2.10.A, 4.3.10.B, 3.1.10.C, 3.1.10.E, 4.8.10.A, 4.2.10.C, 4.4.10C, 3.8.10C

**Anchor(s) or adopted anchor:** S11.A.1.2.1-2, S11.A.1.3.1-2, S11.A.1.3.4, S11.B.3.3.1-3

**Essential content/objectives:** At end of the unit, students will be able to:

- Describe human activities that can affect the biosphere.
- Explain how environmental resources are classified.
- Identify the characteristics of sustainable use.
- Describe how human activities affect land, air and water resources.
- Define biodiversity and explain its value.
- Identify current threats to biodiversity.
- Describe the goal of conservation biology.

**Core Activities:** Students will complete/participate in the following:

- Outline chapter
- Chapter Worksheets
- Make timeline of how humans have altered the biosphere.
- Jigsaw activity regarding examples of renewable and nonrenewable resources.
- Discuss Easter Island
- Show video clip of “How Stuff is Made”

**Extensions:** Study Island, Complete a chart listing the pros and cons of different types of energy, Research a Threatened or Endangered Pennsylvania Species

**Remediation:** Study Island, Review Quizzes, Review Worksheets, Peer Tutoring

**Instructional Methods:** Direct instruction using notes and key terms, Cooperative Learning during labs, Group Discussion, Teacher modeling and visual aids, Independent Student Work

**Materials & Resources:** Textbook, Worksheets, PowerPoints, Overheads, Endangered Species Video.

**Assessments:** Quizzes, Tests, Homework, Student Participation, Labs, Questioning, projects

## Curriculum Scope and Sequence

**Planned Course:** Honors Biology

**Unit:** The Cell

**Time frame:** 12 Days

**State Standards:** 3.1.10.A, 3.2.10A, 3.1.10.C, 3.1.10.E, 4.8.10.A, 4.3.10.C, 3.1.10.B, 3.2.10B, 4.1.10B, 4.6.10A, 3.3.10.A, 3.3.10.B, 4.6.10.A, 4.7.10.B

**Anchor(s) or adopted anchor:** S11.A.1.1.1, S11.A.1.1.2, S11.A.1.1.4, S11.A.1.1.5, S11.A.1.3.2, S11.A.1.3.3, S11.A.3.1.2, S11.A.3.1.3, S11.A.3.1.4, S11.A.3.2.1, S11.A.3.2.2, S11.A.3.2.3, S11.B.1.1.1, S11.B.1.1.2, S11.B.1.1.3

**Essential content/objectives:** At end of the unit, students will be able to:

- Explain the cell theory and the history of the discovery of cells.
- Differentiate between eukaryotes and prokaryotes as well as plant and animal cells.
- List and explain cell parts and functions.
- Describe what happens during diffusion.
- Differentiate between osmosis, facilitated diffusion and active transport.
- Describe what cell specialization is.
- Identify the organization levels in multicellular organisms.

**Core Activities:** Students will complete/participate in the following:

- Outline chapter
- Chapter Worksheets
- Cell Drawings
- Cell Analogy Project
- Organelle Chart
- Cell Lab
- Diffusion Demonstration
- Elodea Osmosis Lab
- Egg Lab

**Extensions:** Study Island, Create a Cell City, Devise a Cell Crossword online

**Remediation:** Study Island, Review Quizzes, Review Worksheets, Peer Tutoring, Cell Model, Cell Song, Cell Organelle Children's book, Create Cell Review Games

**Instructional Methods:** Direct instruction using notes and key terms, Cooperative Learning during labs, Group Discussion, Teacher modeling and visual aids, Independent Student Work, Review Packet, Review Game

**Materials & Resources:** Textbook, Worksheets, PowerPoints, Overheads, Video – “Inside a Cell”, Lab Materials

**Assessments:** Quizzes, Tests, Homework, Student Participation, Labs, Questioning, projects

## Curriculum Scope and Sequence

**Planned Course:** Honors Biology

**Unit:** Photosynthesis and Cellular Respiration

**Time frame:** 5 Days

**State Standards:** 3.1.10A, 3.1.10E, 4.3.10.C, 3.3.10A, 3.3.10B, 4.6.10.A, 4.7.10B

**Anchor(s) or adopted anchor:** S11.A.3.1.1., S11.A.3.1.2, S11.A.3.1.3, S11.A.3.1.4, S11.B.1.1.1, S11.B.1.1.2, S11.B.1.1.3,

**Essential content/objectives:** At end of the unit, students will be able to:

- Explain where plants get the energy they need to produce food.
- Describe the role of ATP in cellular activities.
- State the overall equation for photosynthesis.
- Describe the role of light and chlorophyll in photosynthesis.
- Describe the structure and function of a chloroplast.
- Explain the steps of the light dependent reactions and Calvin Cycle.
- Describe what conditions affect the rate of photosynthesis.
- Explain what cellular respiration is and what happens during glycolysis.
- Differentiate between alcoholic and lactic acid fermentation.
- Explain the steps of the Krebs Cycle and the Electron Transport Chain.
- Compare photosynthesis and cellular respiration.

**Core Activities:** Students will complete/participate in the following:

- Outline Chapter
- Chapter Worksheets
- Concept Maps
- Pigment Chromatography Lab
- Rate of Photosynthesis Lab with yew sprig
- Fermentation Lab
- Chicago Cyanide Murders Activity

**Extensions:** Study Island, Peer Tutoring

**Remediation:** Study Island, Review Quizzes, Review Worksheets, Peer Tutoring,

**Instructional Methods:** Direct instruction using notes and key terms, Cooperative Learning during labs, Group Discussion, Teacher modeling and visual aids, Independent Student Work, Socratic Circle

**Materials & Resources:** Textbook, Worksheets, PowerPoints, Overheads, Lab Materials

**Assessments:** Quizzes, Tests, Homework, Student Participation, Labs, Questioning, projects



## Curriculum Scope and Sequence

**Planned Course:** Honors Biology

**Unit:** Cell Growth and Division

**Time frame:** 5 Days

**State Standards:** 3.2.10.A, 4.3.10B, 3.3.10A, 3.3.10B, 4.6.10.A, 4.7.10.B, 3.3.10.C

**Anchor(s) or adopted anchor:** S11.A.1.2.1, S11.B.1.1.1, S11.B.1.1.3, S11.B.2.2.1, S11.B.2.2.2

**Essential content/objectives:** At end of the unit, students will be able to:

- Explain the problems growth causes for cells and how cell division helps prevent these problems.
- Name and describe the main events of the cell cycle.
- Describe what happens during the four stages of mitosis.
- Explain how the cell cycle is regulated.
- Describe how cancer cells are different from other cells.
- Contrast the chromosome number of body cells and gametes.
- Summarize the events of meiosis.
- Contrast mitosis and meiosis.

**Core Activities:** Students will complete/participate in the following:

- Outline Chapter
- Chapter Worksheets
- Egg in food coloring demo
- Adopt a Chromosome Project
- Mitosis Lab using onion root tips and whitefish blastula slides
- Pipe Cleaner Activities to simulate mitosis or meiosis
- Bead Activity to simulate crossing over
- Karyotype Lab
- Review Packet
- Review Game
- Cancer PowerPoint
- Cancer Research Project

**Extensions:** Study Island, Peer Tutoring

**Remediation:** Study Island, Review Quizzes, Review Worksheets, Peer Tutoring, Practice with pipe cleaners or beads.

**Instructional Methods:** Direct instruction using notes and key terms, Cooperative Learning during labs, Group Discussion, Teacher modeling and visual aids, Independent Student Work

**Materials & Resources:** Textbook, Worksheets, PowerPoints, Overheads, Lab Materials, Cancer PowerPoint: <http://cancer.gov/cancertopics/understandingcancer>, Pictures of cancerous cells,

**Assessments:** Quizzes, Tests, Homework, Student Participation, Labs, Questioning, Projects

## Curriculum Scope and Sequence

**Planned Course:** Honors Biology

**Unit:** DNA and RNA

**Time frame:** 10 Days

**State Standards:** 3.7.10.B, 3.8.10.B, 3.3.10A, 3.3.10.B, 4.6.10.A, 4.7.10.B, 3.3.10.C, 3.3.10.D, 3.4.10.D, 4.7.10C, 4.2.10.C, 4.4.10.C, 3.8.10C

**Anchor(s) or adopted anchor:** S11.A.2.2.1, S11A.2.2.2, S11.B.1.1.1, S11.B.1.1.2, S11.B.1.1.3, S11.B.2.1.2, S11.B.2.1.3, S11.B.2.2.1, S11.B.3.3.3

**Essential content/objectives:** At end of the unit, students will be able to:

- Summarize the relationship between genes and DNA.
- Describe the overall structure of a DNA molecule.
- Relate the DNA molecule to chromosome structure.
- Summarize the events of DNA replication.
- Contrast and compare DNA and RNA.
- Describe the three main types of RNA.
- Describe transcription and the editing of RNA.
- Summarize translation.
- Explain the relationship between genes and proteins.
- Contrast gene mutations and chromosomal mutations.
- Describe how lac genes are turned off and on.
- Explain how most genes are regulated.
- Relate gene regulation to development.
- Explain the purpose of selective breeding.
- Describe two techniques used in selective breeding
- Explain how scientists manipulate DNA.
- Summarize what happens during transformation.
- Describe the usefulness of some transgenic organisms to humans.
- Summarize the main steps in cloning.

**Core Activities:** Students will complete/participate in the following:

- Outline Chapter
- Chapter Worksheets
- DNA Webquest
- DNA extraction Lab from Cheek Cells
- DNA Replication paper folding activity
- Gel Electrophoresis Lab
- [DNA Mutation Simulation](#)
- Manipulating DNA – Plasmid Lab
- Transcription/Translation video segment
- Space Doctor - Gene Therapy Activity
- Hands on simulation of translation
- Watch DNA, Cracking the Code DVD
- Review Packets
- DNA Jeopardy Review Game

**Extensions:** Study Island, Peer Tutoring, Show the movie GATTACA, Read and summarize recent DNA articles

**Remediation:** Study Island, Review Quizzes, Review Worksheets, Peer Tutoring, Building a DNA model

**Instructional Methods:** Direct instruction using notes and key terms, Cooperative Learning during labs, Group Discussion, Teacher modeling and visual aids, Independent Student Work, Socratic Circle

**Materials & Resources:** Textbook, Worksheets, PowerPoints, Overheads, Lab Materials, Human Genome Video (Beginning Segment), Cracking the Code DVD

**Assessments:** Quizzes, Tests, Homework, Student Participation, Labs, Questioning, Projects

## Curriculum Scope and Sequence

**Planned Course:** Honors Biology

**Unit:** Genetics

**Time frame:** 15 Days

**State Standards:** 3.3.10A, 3.3.10B, 4.6.10.A, 4.7.10.B, 3.3.10.C, 3.3.10.D, 3.4.10.D, 4.7.10.C

**Anchor(s) or adopted anchor:** S11.B.1.1.2, S11.B.1.1.3, S11.B.2.2.1, S11.B.2.2.2, S11.B.2.2.3, S11.B.2.1.2, S11.B.2.1.3

**Essential content/objectives:** At end of the unit, students will be able to:

- Summarize Mendel's conclusion about inheritance.
- Differentiate between genotypes and phenotypes.
- Differentiate between dominant and recessive traits.
- Explain Mendel's Law of Segregation and Law of Independent Assortment
- Explain the concept of alleles and chromosomal inheritance.
- Complete monohybrid, dihybrid, trihybrid, codominant, incomplete dominant and sex – linked punnett squares.
- Interpret and create a pedigree.
- Give an example of a polygenic trait and a trait that has multiple alleles.
- Explain how gene maps are produced.
- Describe examples of inheritance of human traits.
- Explain how small changes in DNA can cause genetic disorders.
- Be able to give examples of human genetic disorders and chromosomal disorders.
- Describe sex linked disorders and why they are more common in males than females.
- Explain the process of X chromosome inactivation.
- Summarize nondisjunction and the problems it can cause.

**Core Activities:** Students will complete/participate in the following:

- Outline Chapter
- Chapter Worksheets
- Punnett Square Problems
- Coin Toss Lab
- Design a Species Lab
- Virtual Fly Lab

**Extensions:** Study Island, Peer Tutoring, Brave New Babies Article, Design a Species Project

**Remediation:** Study Island, Review Quizzes, Review Worksheets, Peer Tutoring,

**Instructional Methods:** Direct instruction using notes and key terms, Cooperative Learning during labs, Group Discussion, Teacher modeling and visual aids, Independent Student Work, Peer Instruction to complete punnett squares

**Materials & Resources:** Textbook, Worksheets, PowerPoints, Overheads, Lab Materials

**Assessments:** Quizzes, Tests, Homework, Student Participation, Labs, Questioning, Projects

## Curriculum Scope and Sequence

**Planned Course:** Honors Biology

**Unit:** Evolution

**Time frame:** 5 Days

**State Standards:** 3.1.10.A, 3.2.10.A, 3.1.10.E, 3.3.10.C, 3.3.10.D, 3.4.10.D, 4.7.10.C

**Anchor(s) or adopted anchor:** S11.A.1.1.1, S11.A.1.1.2, S11.A.1.1.3, S11.A.1.1.4, S11.A.1.1.5, S11.B.2.1.1, S11.B.2.1.2, S11.B.2.1.3, S11.B.2.1.4,

**Essential content/objectives:** At end of the unit, students will be able to:

- Describe the pattern Darwin observed among organisms of the Galapagos Islands.
- State how Hutton and Lyell described geological change.
- Identify how Lamarck thought species evolved.
- Describe Malthus's theory of population growth.
- Describe how natural variation is used in artificial selection.
- Explain how natural selection is related to a species' fitness.
- Identify evidence Darwin used to present his case for evolution.
- State Darwin's theory of evolution by natural selection.
- Explain what a gene pool is.
- Identify the main sources of inheritable variation in a population.
- State what determines how a phenotype is produced.
- Explain how natural selection affects single- gene and polygenic traits.
- Describe genetic drift.
- List the five conditions needed to maintain genetic equilibrium.
- Identify the conditions necessary for a new species to evolve.
- Identify important patterns in macroevolution.

**Core Activities:** Students will complete/participate in the following:

- Outline Chapter
- Chapter Worksheets
- Jigsaw with current evolution articles
- Concept Map
- Hardy-Weinburg Lab
- Hardy-Weinberg Practice Problems
- National Geographic Darwin Article
- Evolution Keyword Puzzle
- Evolution of the horse timeline
- Great Transformations Video
- Review Packet

**Extensions:** Study Island, Peer Tutoring, Peppered Moth Lab, Mouse Predator - Prey Lab

**Remediation:** Study Island, Review Quizzes, Review Worksheets, Peer Tutoring, Teddy Graham Lab.

**Instructional Methods:** Direct instruction using notes and key terms, Cooperative Learning during labs, Group Discussion, Teacher modeling and visual aids, Independent Student Work

**Materials & Resources:** Textbook, Worksheets, PowerPoints, Overheads, Lab Materials, Great Transformations Video

**Assessments:** Quizzes, Tests, Homework, Student Participation, Labs, Questioning, Projects

## Curriculum Scope and Sequence

**Planned Course:** Honors Biology

**Unit:** Classification

**Time frame:** 2.5 Days

**State Standards:** 3.1.10A, 3.1.10E, 4.3.10.C, 3.1.10.C, 3.2.10.B, 3.3.10.A, 3.3.10B, 4.6.10A, 4.7.10B

**Anchor(s) or adopted anchor:** S11.A.3.1.2, S11.A.3.3.2, S11.B.1.1.1, S11.B.1.1.2, S11.B.1.1.3

**Essential content/objectives:** At end of the unit, students will be able to:

- Explain how living things are organized for study.
- Describe binomial nomenclature.
- Explain Linneaus's system of classification.
- Explain how evolutionary relationships are important in classification.
- Identify the principle behind cladistic analysis.
- Explain how we can compare very dissimilar organisms.
- Name the six kingdoms of life as they are now identified.
- Describe the three domain system of classification.

**Core Activities:** Students will complete/participate in the following:

- Outline Chapter
- Chapter Worksheets
- What Am I? Activity
- Dichotomous Key Lab

**Extensions:** Study Island, Peer Tutoring, Woolly Mammoth Genome Article, Practice using Dichotomous Keys

**Remediation:** Study Island, Review Quizzes, Review Worksheets, Peer Tutoring, Classification of Common Objects Activity, Classifying Organisms Poster Activity

**Instructional Methods:** Direct instruction using notes and key terms, Cooperative Learning during labs, Group Discussion, Teacher modeling and visual aids, Independent Student Work

**Materials & Resources:** Textbook, Worksheets, PowerPoints, Overheads, Lab Materials

**Assessments:** Quizzes, Tests, Homework, Student Participation, Labs, Questioning, Projects

## Curriculum Scope and Sequence Curriculum Scope and Sequence

**Planned Course:** Honors Biology

**Unit:** Plant Kingdom

**Time frame:** 4 Days

**State Standards:** 3.1.10A, 3.1.10E, 4.3.10.C, 3.1.10.C, 3.2.10.B, 3.3.10.A, 3.3.10B, 4.6.10A, 4.7.10B

**Anchor(s) or adopted anchor:** S11.A.3.1.2, S11.A.3.3.2, S11.B.1.1.1, S11.B.1.1.2, S11.B.1.1.3

**Essential content/objectives:** At end of the unit, students will be able to:

- Identify the characteristics of gymnosperms and angiosperms.
- Differentiate between monocots and dicots.
- Explain how water is transported throughout a plant.
- Describe how the products of photosynthesis are transported throughout a plant.
- Identify the reproductive structures of angiosperms.
- Describe the function and structure of roots and stems.
- Describe how the structure of a leaf enables it to carry out photosynthesis.
- Describe how gas exchange takes place in a leaf.

**Core Activities:** Students will complete/participate in the following:

- Outline Chapter
- Chapter Worksheets
- Flower Dissection
- Lab – Leaf Cross Section
- Fast Plant Lab (will need to start 35 -40 days in advance)

**Extensions:** Study Island, Peer Tutoring,

**Remediation:** Study Island, Review Quizzes, Review Worksheets, Peer Tutoring,

**Instructional Methods:** Direct instruction using notes and key terms, Cooperative Learning during labs, Group Discussion, Teacher modeling and visual aids, Independent Student Work

**Materials & Resources:** Textbook, Worksheets, PowerPoints, Overheads, Lab Materials

**Assessments:** Quizzes, Tests, Homework, Student Participation, Labs, Questioning, Projects



## Curriculum Scope and Sequence

**Planned Course:** Honors Biology

**Unit:** Bacteria and Viruses

**Time frame:** 2.5 Days

**State Standards:** 3.1.10A, 3.1.10E, 4.3.10.C, 3.1.10.C, 3.2.10.B, 3.3.10.A, 3.3.10B, 4.6.10A, 4.7.10B

**Anchor(s) or adopted anchor:** S11.A.3.1.2, S11.A.3.3.2, S11.B.1.1.1, S11.B.1.1.2, S11.B.1.1.3

**Essential content/objectives:** At end of the unit, students will be able to:

- Describe the factors used to identify prokaryotes.
- Describe the ecological roles that bacteria play in the environment.
- Explain how bacteria cause disease.
- Describe the structure of a virus.
- Explain how viruses cause infection.

**Core Activities:** Students will complete/participate in the following:

- Outline Chapter
- Chapter Worksheets
- AIDS activity
- Lab – Growth of bacteria

**Extensions:** Study Island, Peer Tutoring,

**Remediation:** Study Island, Review Quizzes, Review Worksheets, Peer Tutoring,

**Instructional Methods:** Direct instruction using notes and key terms, Cooperative Learning during labs, Group Discussion, Teacher modeling and visual aids, Independent Student Work

**Materials & Resources:** Textbook, Worksheets, PowerPoints, Overheads, Lab Materials

**Assessments:** Quizzes, Tests, Homework, Student Participation, Labs, Questioning, Projects