

Wilson Area School District Planned Course Guide

Title of planned course: Animal Diversity

Subject Area: Science

Grade Level: 12

Course Description: Animal Diversity is a rigorous, senior level course in which students will examine the general characteristics, structures, functions, and evolutionary connections of and between a variety of animals including invertebrate and vertebrate species. Animals such as sponges, cnidarians, arthropods, worms, mollusks, echinoderms, fish, amphibians, reptiles, birds, and mammals will be studied. Course work will include note taking, quizzes, tests, projects and dissections.

Time/Credit for this Course: One half school year / ½ credit

Curriculum Writing Committee: Wendy Baltz, Kelsey Rinehart, Mitchell Wood

Wilson Area School District Planned Course Materials

Course Title: Animal Diversity

Textbook: Biology
Pearson (Kenneth Miller/Joseph Levine)
2004, 2010 editions will be used
(*curriculum objectives taken from these texts)

Supplemental Books:
The Encyclopedia of Animals (Christiansen)
Biology of Animals (6th edition, Hickman/Roberts)
Mammalogy (6th edition, Vaughn)

Teacher Resources:
Provided powerpoint presentations
Other ancillary materials

Curriculum Map

August:

- Begin An Introduction to Animal Diversity

September:

- Finish An Introduction to Animal Diversity
- Sponges
- Cnidarians

October:

- Worms
- Mollusks
- Arthropods

November:

- Echinoderms
- Fish
- Amphibians
- Frog Dissection

December:

- Reptiles
- Birds
- Mammals

January:

- Review for Final Exam

Curriculum Scope & Sequence

Planned Course: Animal Diversity

Unit: An Introduction to Animal Diversity

Time frame: 10 days

State Standards / Anchor(s) or adopted anchor: 3.1.6-8.B, 3.1.6-8.C, 3.1.9-12.B, 3.1.6-8.E

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

- List characteristics that all living organisms share
- Identify groups of living things
- Describe what makes an animal an animal
- Explain embryonic development, types of body symmetry, and body cavity formation in animals
- Discuss essential functions of all animals
- Explain Linnaeus' system of classification

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

- Read and take notes on assigned textbook chapter
- Nightly homework assignments
- Introduction to Animal Diversity powerpoint review and class discussion
- Daily warm-up activities
- Labeling diagrams
- Body Symmetry lab activity
- PhenBL: Investigation of Adaptations using videos
- Key Vocabulary – archaea, bacteria, eukarya, multicellular, heterotrophic, endoderm, mesoderm, ectoderm, blastula, gastrulation, protostome, deuterostome, radial, bilateral, cephalization, acoelomate, pseudocoelomate, coelomate

Extensions:

- Peer tutoring
- Practice using dichotomous keys
- Shape of Life DVD

Remediation:

- Peer tutoring
- Classification of common objects activity

Instructional Methods:

- Individual reading and note taking
- Direct instruction with questioning
- Teacher modeling and visual aids
- Whole class and small group discussion

Materials & Resources:

- Textbook
- Introduction to Animal Diversity powerpoint
- Shape of Life dvd

Assessments:

- Warm ups, homework assignments, and class activities
- Class discussion
- Quizzes
- Introduction to Animal Diversity test

Curriculum Scope & Sequence

Planned Course: Animal Diversity

Unit: Sponges

Time frame: 5 days

State Standards / Anchor(s) or adopted anchor: 3.1.9-12.B, 3.1.9-12.C, 3.1.9-12.D, 3.1.6-8.J, 3.1.9-12.N, 3.1.9-12.S, 3.1.6-8.O, 3.1.6-8.P

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

- Explain why sponges are classified as animals
- Describe the difference between the various types of sponges and their body composition.
- Describe how sponges carry out essential life functions
- Describe filter feeding
- Identification of local species that represent the phylum.

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

- Read and take notes on assigned textbook chapter
- Nightly homework assignments
- Sponges powerpoint review and class discussion
- Daily warm-up activities
- Labeling diagrams
- PhenBL: Investigate Sponge specimens to identify the 3 main groups of sponges.
- Key vocabulary – choanocyte, osculum, spicule, archaeocyte, gemmule

Extensions:

- Peer tutoring
- Sponge slide lab
- Shape of Life dvd

Remediation: Peer tutoring

Instructional Methods:

- Individual reading and note taking
- Direct instruction with questioning
- Teacher modeling and visual aids
- Whole class and small group discussion

Materials & Resources:

- Textbook
- Sponges powerpoint
- Shape of Life dvd

Assessments:

- Warm ups, homework assignments, and class activities
- Class discussion
- Quizzes
- Sponges test

Curriculum Scope & Sequence

Planned Course: Animal Diversity

Unit: Cnidarians

Time frame: 5 days

State Standards / Anchor(s) or adopted anchor: 3.1.9-12.B, 3.1.9-12.C, 3.1.9-12.D, 3.1.6-8.J, 3.1.9-12.N, 3.1.9-12.S, 3.1.6-8.O, 3.1.6-8.P

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

- Identify 3 groups of cnidarians
- Describe two types of cnidarian body plans
- Describe how cnidarians carry out essential life functions
- Identification of local species that represent the phylum.

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

- Read and take notes on assigned textbook chapter
- Nightly homework assignments
- Cnidarians powerpoint review and class discussion
- Daily warm-up activities
- Labeling diagrams
- PhenBL: Investigate Live Hydra Behavior to Stimuli
- Key Vocabulary – cnidocyte, nematocyst, polyp, medusa, gastrovascular cavity, nerve net, hydrostatic skeleton

Extensions:

- Peer tutoring
- Cnidarian slide lab
- Shape of Life dvd

Remediation: Peer tutoring

Instructional Methods:

- Individual reading and note taking
- Direct instruction with questioning
- Teacher modeling and visual aids
- Whole class and small group discussion

Materials & Resources:

- Textbook
- Cnidarians powerpoint
- Shape of Life dvd

Assessments:

- Warm ups, homework assignments, and class activities
- Class discussion
- Quizzes
- Cnidarians test

Curriculum Scope & Sequence

Planned Course: Animal Diversity

Unit: Worms

Time frame: 7 days

State Standards / Anchor(s) or adopted anchor: 3.1.9-12.B, 3.1.9-12.C, 3.1.9-12.D, 3.1.6-8.J, 3.1.9-12.N, 3.1.9-12.S, 3.1.6-8.O, 3.1.6-8.P

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

- Identify defining features of flatworms, roundworms, and annelids
- Explain characteristics of flatworms, roundworms, and annelids
- Describe the parasitic relationship between common roundworms and humans
- Identification of local species that represent the phylum.

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

- Read and take notes on assigned textbook chapter
- Nightly homework assignments
- Worms powerpoint review and class discussion
- Daily warm-up activities
- Labeling diagrams
- PhenBL: Live Worm Behavior Lab (planaria, earthworms)
- Earthworm Dissection
- Key Vocabulary – acoelomate, coelom, pharynx, flame cell, ganglion, eyespot, scolex, proglottid, pseudocoelom, septum, seta, crop, gizzard, closed circulatory system, nephridium, clitellum

Extensions:

- Peer tutoring
- Tapeworm slide lab
- Shape of Life dvd

Remediation: Peer tutoring

Instructional Methods:

- Individual reading and note taking
- Direct instruction with questioning
- Teacher modeling and visual aids
- Whole class and small group discussion

Materials & Resources:

- Textbook
- Worms powerpoint
- Shape of Life dvd

Assessments:

- Warm ups, homework assignments, and class activities
- Class discussion
- Quizzes
- Worms test

Curriculum Scope & Sequence

Planned Course: Animal Diversity

Unit: Mollusks

Time frame: 7 days

State Standards / Anchor(s) or adopted anchor: 3.1.9-12.B, 3.1.9-12.C, 3.1.9-12.D, 3.1.6-8.J, 3.1.9-12.N, 3.1.9-12.S, 3.1.6-8.O, 3.1.6-8.P

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

- Explain defining features of mollusks
- Describe the basic body plan of mollusks
- Describe characteristics of three main classes of mollusks
- Identification of local species that represent the phylum.

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

- Read and take notes on assigned textbook chapter
- Nightly homework assignments
- Mollusks powerpoint review and class discussion
- Daily warm-up activities
- Labeling diagrams
- PhenBL: Shell Lab - Investigate various shells to identify animals that created them
- Squid Dissection
- Key vocabulary – trochophore, foot, mantle, shell, visceral mass, radula, siphon, open circulatory system

Extensions:

- Peer tutoring
- Clam dissection Video
- Shape of Life dvd

Remediation: Peer tutoring

Instructional Methods:

- Individual reading and note taking
- Direct instruction with questioning
- Teacher modeling and visual aids
- Whole class and small group discussion

Materials & Resources:

- Textbook
- Mollusks powerpoint
- Mollusk shells for ID lab
- Shape of Life dvd

Assessments:

- Warm ups, homework assignments, and class activities
- Class discussion
- Quizzes
- Mollusks test

Curriculum Scope & Sequence

Planned Course: Animal Diversity

Unit: Arthropods

Time frame: 7 days

State Standards / Anchor(s) or adopted anchor: 3.1.9-12.B, 3.1.9-12.C, 3.1.9-12.D, 3.1.6-8.J, 3.1.9-12.N, 3.1.9-12.S, 3.1.6-8.O, 3.1.6-8.P

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

- Describe the main characteristics of arthropods
- Identify important trends in arthropod evolution
- Explain what happens when an arthropod outgrows its exoskeleton
- Identification of local species that represent the phylum.

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

- Read and take notes on assigned textbook chapter
- Nightly homework assignments
- Arthropods powerpoint review and class discussion
- Daily warm-up activities
- Labeling diagrams
- Virtual Grasshopper and Crayfish Dissection
- Comparative study of the structure of types of spider webs.
- PhenBL: Comparative investigation of the anatomy of Arthropods.
- Key vocabulary – exoskeleton, chitin, appendage, tracheal tube, spiracle, book lung, Malpighian tubule, molting

Extensions:

- Peer tutoring
- Shape of Life dvd

Remediation: Peer tutoring

Instructional Methods:

- Individual reading and note taking
- Direct instruction with questioning
- Teacher modeling and visual aids
- Whole class and small group discussion

Materials & Resources:

- Textbook
- Arthropods powerpoint
- Shape of Life dvd

Assessments:

- Warm-ups, homework assignments, and class activities
- Class discussion
- Quizzes
- Arthropods test

Curriculum Scope & Sequence

Planned Course: Animal Diversity

Unit: Echinoderms

Time frame: 3 days

State Standards / Anchor(s) or adopted anchor: 3.1.9-12.B, 3.1.9-12.C, 3.1.9-12.D, 3.1.6-8.J, 3.1.9-12.N, 3.1.9-12.S, 3.1.6-8.O, 3.1.6-8.P

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

- Describe distinguishing features of echinoderms
- Explain life functions carried out by the water vascular system of echinoderms
- Identify the different classes of echinoderms
- Identification of local species that represent the phylum.

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

- Read and take notes on assigned textbook chapter
- Nightly homework assignments
- Echinoderms powerpoint review and class discussion
- Daily warm-up activities
- Virtual Echinoderm Dissection
- PhenBL: Investigate and Compare Echinoderm Specimens.
- Labeling diagrams
- Key vocabulary – endoskeleton, water vascular system, madreporite, tube foot

Extensions:

- Peer tutoring
- Shape of Life dvd
- Investigation of Feeding Methods for Echinoderms.

Remediation: Peer tutoring

Instructional Methods:

- Individual reading and note taking
- Direct instruction with questioning
- Teacher modeling and visual aids
- Whole class and small group discussion

Materials & Resources:

- Textbook
- Echinoderms powerpoint
- Shape of Life DVD

Assessments:

- Warm ups, homework assignments, and class activities
- Quizzes
- Echinoderms test

Curriculum Scope & Sequence

Planned Course: Animal Diversity

Unit: Fish

Time frame: 7 days

State Standards / Anchor(s) or adopted anchor: 3.1.9-12.B, 3.1.9-12.C, 3.1.9-12.D, 3.1.6-8.J, 3.1.9-12.N, 3.1.9-12.S, 3.1.6-8.O, 3.1.6-8.P

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

- Compare and contrast non-vertebrate chordates to vertebrate chordates.
- Describe the basic characteristics of fish
- Identify the most important developments during the evolution of fish
- Explain how fish are adapted for life in the water
- Identify the three main groups of fish
- Identification of local species that represent the phylum.

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

- Read and take notes on assigned textbook chapter
- Nightly homework assignments
- Fish powerpoint review and class discussion
- Daily warm-up activities
- Labeling diagrams
- PhenBL: Investigation of Freshwater Parasites and Diseases.
- Research negative effects of invasive species on local native populations.
- Hatchery Management Practices
- Key vocabulary – cartilage, atrium, ventricle, cerebrum, cerebellum, medulla oblongata, lateral line system, swim bladder, oviparous, ovoviviparous, viviparous

Extensions:

- Peer tutoring
- Shape of Life dvd
- Wildlife Fish and Game - Stocking and catching techniques.

Remediation: Peer tutoring

Instructional Methods:

- Individual reading and note taking
- Direct instruction with questioning
- Teacher modeling and visual aids
- Whole class and small group discussion

Materials & Resources:

- Textbook
- Fish powerpoint
- Shape of Life DVD

Assessments:

- Warm ups, homework assignments, and class activities
- Class discussion
- Quizzes
- Fish test

Curriculum Scope & Sequence

Planned Course: Animal Diversity

Unit: Amphibians

Time frame: 9 days

State Standards / Anchor(s) or adopted anchor: 3.1.9-12.B, 3.1.9-12.C, 3.1.9-12.D, 3.1.6-8.J, 3.1.9-12.N, 3.1.9-12.S, 3.1.6-8.O, 3.1.6-8.P

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

- Describe characteristics of amphibians
- Explain how amphibians are adapted for life on land
- Identify the main groups of living amphibians
- Identification of local species that represent the phylum

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

- Read and take notes on assigned textbook chapter
- Nightly homework assignments
- Amphibians powerpoint review and class discussion
- Daily warm-up activities
- Labeling diagrams
- Frog Dissection
- PhenBL: Study of Frog Population Decline (Chytrid Fungus)
- Key vocabulary – cloaca, nictitating membrane, tympanic membrane

Extensions:

- Peer tutoring
- Shape of Life DVD

Remediation:

- Peer tutoring
- Virtual Frog Dissection

Instructional Methods:

- Individual reading and note taking
- Direct instruction with questioning
- Teacher modeling and visual aids
- Whole class and small group discussion

Materials & Resources:

- Textbook
- Amphibians powerpoint
- Frog dissection paperwork
- Goliath frog skull
- Shape of Life DVD

Assessments:

- Warm ups, homework assignments, and class activities
- Class discussion
- Quizzes
- Amphibians test

Curriculum Scope & Sequence

Planned Course: Animal Diversity

Unit: Reptiles

Time frame: 7 days

State Standards / Anchor(s) or adopted anchor: 3.1.9-12.B, 3.1.9-12.C, 3.1.9-12.D, 3.1.6-8.J, 3.1.9-12.N, 3.1.9-12.S, 3.1.6-8.O, 3.1.6-8.P

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

- Describe the characteristics of reptiles
- Explain how reptiles are adapted for life on land
- Identify four living orders of reptiles
- Identification of local species that represent the phylum.

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

- Read and take notes on assigned textbook chapter
- Nightly homework assignments
- Reptiles powerpoint review and class discussion
- Daily warm-up activities
- Labeling diagrams
- Inquiry into Endangered PA Reptiles
- Microscope investigation of scales.
- Key vocabulary – ectotherm, amniotic egg, carapace, plastron

Extensions:

- Peer tutoring
- Shape of Life dvd
- American alligator Skull Study

Remediation: Peer tutoring

Instructional Methods:

- Individual reading and note taking
- Direct instruction with questioning
- Teacher modeling and visual aids
- Whole class and small group discussion

Materials & Resources:

- Textbook
- Reptiles powerpoint
- American alligator skull
- Shape of Life dvd

Assessments:

- Warm ups, homework assignments, and class activities
- Class discussion
- Quizzes
- Reptiles test

Curriculum Scope & Sequence

Planned Course: Animal Diversity

Unit: Birds

Time frame: 5 days

State Standards / Anchor(s) or adopted anchor: 3.1.9-12.B, 3.1.9-12.C, 3.1.9-12.D, 3.1.6-8.J, 3.1.9-12.N, 3.1.9-12.S, 3.1.6-8.O, 3.1.6-8.P

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

- Describe characteristics that birds have in common
- Explain how birds are adapted for flight
- Identification of local species that represent the phylum.

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

- Read and take notes on assigned textbook chapter
- Nightly homework assignments
- Birds powerpoint review and class discussion
- Daily warm-up activities
- Labeling diagrams
- Owl Pellet Dissection
- Inquiry into Sexual Dimorphism
- PhenBL: Investigation of Feathers Lab (All About Feathers - Online: Cornell Lab of Ornithology)
- Key vocabulary – feather, endoderm, crop, gizzard, air sac

Extensions:

- Peer tutoring
- Shape of Life DVD
- Bird of Prey Calls

Remediation: Peer tutoring

Instructional Methods:

- Individual reading and note taking
- Direct instruction with questioning
- Teacher modeling and visual aids
- Whole class and small group discussion

Materials & Resources:

- Textbook
- Cornell Lab - Bird Academy
- Birds powerpoint
- Hawk skull
- Shape of Life DVD

Assessments:

- Warm ups, homework assignments, and class activities
- Class discussion
- Quizzes
- Birds test

Curriculum Scope & Sequence

Planned Course: Animal Diversity

Unit: Mammals

Time frame: 7 days

State Standards / Anchor(s) or adopted anchor: 3.1.9-12.B, 3.1.9-12.C, 3.1.9-12.D, 3.1.6-8.J, 3.1.9-12.N, 3.1.9-12.S, 3.1.6-8.O, 3.1.6-8.P

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

- Describe characteristics of mammals
- Explain when and how mammals evolved
- Describe how mammals maintain homeostasis
- Contrast three main groups of extant mammals
- Compare characteristics of all primates

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

- Read and take notes on assigned textbook chapter
- Nightly homework assignments
- Mammals powerpoint review and class discussion
- Daily warm-up activities
- Labeling diagrams
- PhenBL: Identification of Pelts and Skulls
- Investigation of Mammals - Placental, Marsupial, Monotremes
- Evolution exploration of Primates
- Key Vocabulary – mammary gland, subcutaneous fat, rumen, diaphragm, cerebral cortex, monotreme, marsupial, placenta, binocular vision, prehensile, bipedal, opposable thumb

Extensions:

- Peer tutoring
- Pig Dissection
- Shape of Life DVD
- Chimp vs. Man skull study

Remediation:

- Peer tutoring
- Virtual Pig Dissection

Instructional Methods:

- Individual reading and note taking
- Direct instruction with questioning
- Teacher modeling and visual aids
- Whole class and small group discussion

Materials & Resources:

- Textbook
- Mammals powerpoint
- Chimp skull
- Human skull
- Shape of Life DVD

Assessments:

- Warm ups, homework assignments, and class activities
- Class discussion
- Quizzes
- Mammals test