

RCSD Zoology I/II * Quick Reference Pacing Guide * 2024-2025

Zoology I is a ½ credit course, and Zoology II is a ½ credit course. Students do not have to complete Zoology I before enrolling in Zoology II.

This document serves as a suggested sequence of topics for Zoology I and II.

For a complete description of the course, standards, and detailed performance objectives, see the [MS College and Career Readiness Standards for Science](#)

Zoology I

1st Nine Weeks of the Semester

Classroom Expectations; Lab Safety; Tools of Science; Science and Engineering Practices

Evolution

ZOO.1 Students will develop a model of evolutionary change over time.

ZOO.1.1 Dichotomous keys to distinguish animals from protists, plants, and fungi.

ZOO.1.2 Fossil Record as Evidence of Life on Earth

ZOO.1.3 Classification is related to Evolutionary History

ZOO.1.4 Cladograms and Phylogenetic Trees

ZOO.1.5 Adaptations, Natural Selection, Changes in Populations

Phyla Porifera and Cnidaria

ZOO.2 Students will understand the structure and function of phylum Porifera and phylum Cnidaria and how each adapts to their environments.

ZOO.2.1 Symmetry/Body Plans

ZOO.2.2 Anatomy and Physiology of Sponges

ZOO.2.3 Importance of Porifera in aquatic habitats

ZOO.2.4 The flow of water through sponges

ZOO.2.6 Polyp Lifestyle; Single body openings

ZOO.2.7 Nematocysts (stinging cells) of Cnidarians

ZOO.2.9 Ecological importance of/human impacts on coral reefs

ZOO.2.10 Model the anatomy of cnidarians

Phylum Mollusca

ZOO.3 Students will understand the structure and function of phylum Mollusca, and how they adapt to their environments.

ZOO.3.1 Common body plan of mollusks

ZOO.3.2 Classification of mollusks

ZOO.3.3 Mantle of mollusks

ZOO.3.4 Radula and feeding

ZOO.3.5 Dichotomous key to contrast characteristics of gastropods, bivalves, and cephalopods.

ZOO.3.6 Unique adaptations of cephalopods

ZOO.3.7 Anatomy of gastropods, bivalves, and cephalopods.

Second Nine Weeks of the Semester

Phyla Platyhelminthes, Nematoda, and Annelida

ZOO.4 Students will describe the evolution of structure and function of phylum Platyhelminthes, phylum Nematoda, and phylum Annelida.

ZOO.4.1 Closed circulatory system of annelids

ZOO.4.2 Parasitic and free living worms

ZOO.4.3 Characteristics and Life Styles of worms

ZOO.4.4 Body plans of worms

ZOO.4.5 Evolutionary importance of the segmented body plans of annelids

ZOO.4.6 Dissect representative taxa

Phylum Arthropoda

ZOO.5 Students will understand the basic structure and function of phylum Arthropoda, and how they demonstrate the characteristics of living things.

ZOO.5.1 Evolutionary advantages of specific arthropod structures; how they contribute to arthropods being the largest phyla in species diversity and the most geographically diverse

ZOO.5.2 Exoskeleton

ZOO.5.4 Organisms and characteristics of chelicerates, crustaceans, and insects.

ZOO.5.5 Importance of toxins for arachnids

ZOO.5.6 Importance of chela for decapods

ZOO.5.7 Complete and incomplete metamorphosis

ZOO.5.8 Importance of eusociality in insects, such as ants, bees, and termites.

ZOO.5.9 Dissect representative taxa

Phylum Echinodermata

ZOO.6 Students will understand the structure and function of phylum Echinodermata, and how they demonstrate the characteristics of living things.

ZOO.6.1 Echinoderm spines are extensions of plates that form from the endoskeleton

ZOO.6.2 Starfish stomach inverts for external digestion

ZOO.6.2 Defense structures and behaviors of sea urchins and sea cucumbers

ZOO.6.3 Sexual and asexual reproduction of starfish

ZOO.6.4 Water vascular system for locomotion, feeding, and gas exchange.

ZOO.6.5 Implications of applying the regeneration of starfish to human medicine

ZOO.6.6 Dissect representative taxa and compare their internal and external anatomy and complexity.

Zoology II

1st Nine Weeks of the Semester

Classroom Expectations

Lab Safety; Tools of Science

Science and Engineering Practices

ZOO.1 - Evolution does not need to be repeated IF the entire class successfully completed ZOO I and are continuing ZOO II.

If the class has not taken ZOO I, start with standard ZOO.1 Students will develop a model of evolutionary change over time.

Phylum Chordata, Classes Chondrichthyes and Osteichthyes

ZOO.7 Students will understand the structure and function of phylum Chordata, classes Chondrichthyes and Osteichthyes, and how they demonstrate the characteristics of living things.

ZOO.7.1 Evolutionary changes lead to the diversity of fish; adaptations for various aquatic environments.

ZOO.7.2 Characteristics of class Chondrichthyes and Osteichthyes.

ZOO.7.3 Specific fish species and characteristics that differentiate class Chondrichthyes

ZOO.7.4 Body and jaw design of sharks

ZOO.7.5 Anatomical features of the bony fish

ZOO.7.6 The effects of urbanization and continued expansion by humans on the biodiversity of fish species

ZOO.7.7 Dissect representative taxa and compare their internal and external anatomy and complexity.

Phylum Chordata, Classes Amphibia and Reptilia

ZOO.8 Students will understand the structure and function of phylum Chordata, classes Amphibia and Reptilia, and how they demonstrate the characteristics of living things.

ZOO.8.1 Evolution of tetrapods and the development of the structure and function of body systems and life cycles.

ZOO.8.2 Life cycle of amphibians; morphological and physiological changes that cause amphibians to spend part of their lives in water and part on land

ZOO.8.3 Adaptations of reptiles that led to living on land

ZOO.8.4 Ectothermic regulation in reptiles

ZOO.8.5 Chemosensory in snakes

ZOO.8.7 Compare and contrast living and extinct reptiles.

ZOO.8.8 Importance of tetrapod evolution.

ZOO.8.9 The amniotic egg as the major derived characteristic of reptiles.

ZOO.8.10 Dissect representative taxa

Second Nine Weeks of the Semester

Phylum Chordata, Class Aves

ZOO.9 Students will understand the structure and function of phylum Chordata, class Aves, and how they demonstrate the characteristics of living things.

ZOO. 9.1 Evolutionary history of birds; adaptations to changing environments over time

ZOO. 9.2 Fossil evidence of bird evolution

ZOO. 9.3 Endothermic; how birds regulate body temperature in extreme environments.

ZOO. 9.5 Keen sight in birds of prey

ZOO. 9.6 Intellect of corvids

ZOO. 9.7 Importance of the evolution of flight and feathers, including the morphological and physiological adaptations needed to sustain flight.

ZOO. 9.9 Different adaptations of the bird beak and feet that allow them to feed and survive in different environments.

ZOO. 9.11 Parenting behavior of different birds

ZOO. 9.13 Bird migration

ZOO. 9.14 Dissect representative taxa and compare their internal and external anatomy and complexity.

Phylum Chordata, Class Mammalia

ZOO.10 Students will understand the structure and function of phylum Chordata, class Mammalia, and how they demonstrate the characteristics of living things.

ZOO 10.1 Characteristics and behaviors that distinguish mammals from other phyla; characteristics and behaviors to distinguish the major orders; how human impact has changed the environments of other organisms.

ZOO 10.2 Characteristics of the first true mammal.

ZOO 10.3 Monotremes, marsupials, and eutherians; the importance and differences in the placenta in marsupials and eutherians.

ZOO 10.4 Characteristics that make primates unique, including how the center of gravity relates to the evolution of bipedalism.

ZOO 10.5 Dissect representative taxa and compare their internal and external anatomy and complexity.

ZOO 10.6 Human impacts on the environments of aquatic and terrestrial organisms (e.g., habitat destruction, urbanization, and climate change).

