

Unit	Topic	Lesson	Lab	Objective	Objective	Objective	Objective
<b>Biology Introduction</b>							
<b>Introduction to Biology</b>							
		<b>What is biology?</b>	Rabbit Population by Season	Recognize some possible benefits from studying biology.	Summarize the characteristics of living things.		
		<b>Biology in Your World</b>		Evaluate the impact of scientific research on the environment.	Evaluate the impact of scientific research on society with respect to increasing food supplies.	Explain the primary task of the Human Genome Project.	Describe the contribution of scientists in fighting AIDS and cancer.
		<b>Scientific Processes</b>	Colligative Properties	Describe the stages common to scientific investigations.	Distinguish between forming a hypothesis and making a prediction.	Differentiate a control group from an experimental group and an independent variable from a dependent variable.	Define the word theory as used by scientist.
		<b>Tools and Procedures</b>	Mystery Powder Analysis	Describe the measurement system most scientists use.	Explain how light microscopes and electron microscopes are similar and different.	Describe two common laboratory techniques.	Explain why it is important to work safely in biology.
<b>Chemistry of Life</b>							
		<b>The Nature of Matter</b>	Element Builder	Identify the three subatomic particles found in atoms.	Explain how all of the isotopes of an element are similar and how they are different.	Explain what chemical compounds are.	Describe the two main types of chemical bonds.
		<b>Properties of Water</b>	Solubility and Temperature	Explain why water molecules are polar.	Differentiate between solutions and suspensions.	Explain what acidic solutions and basic solutions are.	
		<b>Carbon Compounds</b>	Covalent Bonds	Describe the functions of each group of organic compounds.			
		<b>Chemical Reactions and Enzymes</b>	Collision Theory	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.	
<b>Ecology</b>							
<b>Biosphere</b>							

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		<b>What is ecology?</b>	Interdependence of Plants and Animals	Identify the levels of organization that ecologists study.	Describe the methods used to study ecology.		
		<b>Energy Flow in Ecosystems</b>	Food Chain	Distinguish between producers and consumers.	Compare food webs with food chains.	Describe why food chains are rarely longer than three or four links.	
		<b>Cycles of Matter</b>	Water Cycle	Describe how matter cycles among the living and nonliving parts of an ecosystem.	Explain why nutrients are important in living systems.	Describe how the availability of nutrients affects the productivity of ecosystems.	
<b>Ecosystems and Biomes</b>							
		<b>The Role of Climate</b>	Seasons: Why do we have them?	Identify the causes of climate.	Explain how Earth's temperature range is maintained.	Identify Earth's three main climate zones.	
		<b>What shapes an ecosystem?</b>	Water Pollution	Explain how biotic/abiotic factors influence and ecosystem.	Identify interactions that occur within communities.	Describe how ecosystems recover from a disturbance.	
		<b>Biomes</b>	Effect of Environment on New Life Form	Explain what microclimates are.	Identify the characteristics of major land biomes.		
		<b>Aquatic Ecosystems</b>	Tides	Identify the factors that govern aquatic ecosystems.	Identify the two types of freshwater ecosystems.	Describe the characteristics of the marine zones.	
<b>Populations</b>							
		<b>Population Dynamics</b>	Estimating Population Size	Compare and contrast exponential and linear population growth.	Relate the reproductive patterns of different populations of organism to models of population growth.	Predict effects of environmental factors on population growth.	
		<b>Human Populations</b>		Identify how the birthrate and death rate affect the rate at which a population changes.	Compare the age structure of rapidly growing, slow-growing, and no-growing countries.	Explain the relationship between a population and the environment.	
<b>Environments</b>							
		<b>Vanishing Species</b>	Rainfall and Bird Beaks	Explain biodiversity and its importance.	Relate various threats to the loss of biodiversity.		

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		<b>Conservation of Biodiversity</b>		Describe strategies used in conservation biology.	Relate success in protecting an endangered species to the methods used to protect it.		
<b>Cells</b>							
<b>Cell Structures and Functions</b>							
		<b>Life is Cellular</b>	Paramecium Homeostasis	Explain what the cell theory is.	Describe how researchers explore the living cell.	Distinguish between eukaryotes and prokaryotes.	
		<b>Eukaryotic Cell Structure</b>	Cell Structure	Describe the function of the cell nucleus.	Describe the functions of the major cell organelles.	Identify the main roles of the cytoskeleton.	
		<b>Cell Boundaries</b>	Osmosis	Identify the main functions of the cell membrane and the cell wall.	Describe what happens during diffusion.	Explain the processes of osmosis, facilitated diffusion, and active transport.	
		<b>The Diversity of Cellular Life</b>		Describe cell specialization.	Identify the organization levels in multicellular organisms.		
		<b>Cell Growth and Reproduction</b>	Cell Division	Sequence the events of the cell cycle.	Relate the function of a cell to its organization into tissues, organs, and organ systems.		
		<b>Control of the Cell Cycle</b>		Describe the role of enzymes in the regulation of the cell cycle.	Distinguish between the events of a normal cell cycle and the abnormal events that result in cancer.	Identify ways to potentially reduce the risk of cancer.	
<b>Energy in a Cell</b>							
		<b>The Need for Energy</b>	Cell Energy Cycle	Explain why organism need a supply of energy.	Describe how energy is stored and released by ATP.		
		<b>Photosynthesis: Trapping the Sun's Energy</b>	Photosynthesis - Activity A	Relate the structure of chloroplasts to the events in photosynthesis.	Describe light-dependent reactions.	Explain the reactions and products of the light-independent Calvin cycle.	

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		<b>Getting Energy to Make ATP</b>		Compare and contrast cellular respiration and fermentation.	Explain how cells obtain energy from cellular respiration.		
<b>Genetics</b>							
<b>Mendel and Meiosis</b>							
		<b>The Work of Gregor Mendel</b>	Mouse Breeding	Describe how Mendel studied inheritance in peas.	Summarize Mendel's conclusion about inheritance.	Explain the principle of dominance.	Describe what happens during segregation.
		<b>Probability and Punnett Squares</b>	Mouse Genetics (Fur Color)	Explain how geneticists use the principles of probability.	Describe how geneticists use Punnett squares.		
		<b>Exploring Mendelian Genetics</b>	Chicken Genetics	Explain the principle of independent assortment.	Describe other inheritance patterns.	Explain how Mendel's principles apply to organisms.	
		<b>Meiosis</b>		Contrast the chromosome number of body cells and gametes.	Summarize the events of meiosis.	Contrast meiosis and mitosis.	
		<b>Linkage and Gene Maps</b>	Hardy-Weinberg Equilibrium	Identify the structures that actually assort independently.	Explain how gene maps are produced.		
<b>DNA and RNA</b>							
		<b>DNA</b>	Building DNA	Summarize the relationship between genes and DNA.	Describe the overall structure of the DNA molecule.		
		<b>Chromosomes and DNA Replication</b>		Summarize the events of DNA replication.	Relate the DNA molecule to chromosome structure.		
		<b>RNA and Protein Synthesis</b>	RNA and Protein Synthesis	Tell how RNA differs from DNA.	Name the three main types of RNA.	Describe transcription and the editing of RNA.	Identify the genetic code.
		<b>Mutations</b>		Contrast gene mutations and chromosomal mutations.			
		<b>Gene Regulation</b>	Effect of Temperature on Gender	Describe a typical gene.	Describe how lac genes are turned off and on.	Explain how most eukaryotic genes are controlled.	Relate gene regulation and development.
<b>Human Genome</b>							

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		<b>Human Heredity</b>	Human Karyotyping	Identify the types of human chromosomes in a karyotype.	Explain how sex is determined.	Explain how pedigrees are used to study human traits.	Describe examples of the inheritance of human traits.
		<b>Human Chromosomes</b>		Identify characteristics of human chromosomes.	Describe some sex-linked disorders and explain why they are more common in males than in females.	Explain the process of X-chromosome inactivation.	Summarize nondisjunction and the problems it causes.
		<b>Human Molecular Genetics</b>	DNA Fingerprint Analysis	Summarize methods of human DNA analysis.	State the goal of the Human Genome Project.	Describe how researches are attempting to cure genetic disorders.	
<b>Gene Technology</b>							
		<b>Changing the Living World</b>	Rainfall and Bird Beaks	Explain the purpose of selective breeding.	Describe two techniques used in selective breeding.	Tell why breeders try to induce mutations.	
		<b>Manipulating DNA</b>		Explain how scientists manipulate DNA.			
		<b>Cell Transformation</b>		Summarize what happens during transformation.	Explain how you can tell is a transformation experiment has been successful.		
		<b>Application of Genetic Engineering</b>	Mouse Genetics	Describe the usefulness of some transgenic organisms to humans.	Summarize the main steps in cloning.		
<b>Evolution of Life</b>							
<b>History of Life</b>							
		<b>The Record of Life</b>	Evolution: Mutation and Selection	Identify the different types of fossils and how they are formed.	Summarize the major events of the geologic time scale.		
		<b>The Origin of Life</b>		Analyze early experiments that support the concept of biogenesis.	Review, analyze, and critique modern theories of the origin of life.	Relate hypotheses about the origin of cells to the environmental conditions of early Earth.	
<b>Theory of Evolution</b>							

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		<b>Natural Selection and the Evidence for Evolution</b>	Natural Selection	Summarize Darwin's theory of natural selection.	Explain how the structural and physiological adaptations of organisms relate to natural selection.	Distinguish among the types of evidence for evolution.	
		<b>Mechanisms of Evolution</b>	Microevolution	Summarize the effects of the different types of natural selection on gene pools.	Relate changes in genetic equilibrium to mechanisms of speciation.	Explain the role of natural selection in convergent and divergent evolution.	
<b>Primate Evolution</b>							
		<b>Primate Adaptation and Evolution</b>		Recognize the adaptations of primates.	Compare and contrast the diversity of living primates.	Distinguish the evolutionary relationships of primates.	
		<b>Human Ancestry</b>		Compare and contrast the adaptations of australopithecines with those of apes and humans.	Identify the evidence of the major anatomical changes in hominids during human evolution.		
<b>Classification of Life</b>							
		<b>Classification</b>		Evaluate the history, purpose, and methods of taxonomy.	Explain the meaning of a scientific name.	Describe the organization of taxa in a biological classification system.	
		<b>The Six Kingdoms</b>		Describe how evolutionary relationships are determined.	Explain how cladistics reveals phylogenetic relationships.	Compare the six kingdoms of organisms.	
<b>Microorganisms and Fungi</b>							
<b>Bacteria and Viruses</b>							
		<b>Viruses</b>	Virus Life Cycle (Lytic)	Describe why a virus is not considered a living organism.	Summarize the discovery of the tobacco mosaic virus.	Describe the basic structure of a virus.	Summarize the steps of viral replication.
		<b>Bacteria</b>		List seven differences between bacteria and eukaryotic cells.	Describe three different ways bacteria can obtain energy.	Describe the external and internal structure of Escherichia coli.	Distinguish the ways that bacteria cause disease.
<b>Protists</b>							
		<b>The Kingdom Protista</b>		Explain what a protist is.			

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		<b>Animallike Protists: Protozoans</b>		Describe the major phyla of animallike protists.	Explain how animallike protists harm other living things.		
		<b>Plantlike Protists: Unicellular Algae</b>		Describe the function of chlorophyll and accessory pigments in algae.	Describe the major phyla of unicellular algae.	Summarize the ecological roles of unicellular algae.	
		<b>Plantlike Protists: Red, Brown, and Green Algae</b>		Describe the major phyla of multicellular algae.	Explain how multicellular algae reproduce.	Identify some human uses of algae.	
		<b>Funguslike Protists</b>		Compare and contrast funguslike protists and fungi.	Describe slime molds and water molds.	Summarize the ecological roles of funguslike protists.	
<b>Fungi</b>							
		<b>Characteristics of Fungi</b>		List the characteristics of the kingdom Fungi.	Describe the structure of a typical fungus body.	Identify how fungi obtain nutrients.	Relate the way fungi obtain nutrients to their role in ecosystems.
		<b>Fungal Diversity</b>		Describe the characteristics used to classify fungi.	List two commercial uses for fungi.	Describe three phyla of fungi.	Distinguish between the life cycles of zygomycetes, ascomycetes, and basidiomycetes.
		<b>Fungal Partnerships</b>		Distinguish two symbiotic relationships that involve fungi.	Summarize the ecological importance of mycorrhizae.	Describe lichens.	
<b>Plants</b>							
<b>What is a plant?</b>							
		<b>Adapting to Life on Land</b>		Compare and contrast characteristics of algae and plants.	Identify and evaluate structural adaptations of plants to their land environments.	Describe the alternation of generation in land plants.	
		<b>Survey of the Plant Kingdom</b>		Describe the phylogenetic relationships among divisions of plants.	Identify the twelve plant kingdom divisions.		
<b>Plant Diversity</b>							

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		<b>Nonvascular Plants</b>		Identify the structures of nonvascular plants.	Compare and contrast characteristics of the different groups of nonvascular plants.		
		<b>Non-Seed Vascular Plants</b>		Evaluate the significance of plant vascular tissue to life on land.	Identify and analyze the characteristics of the non-seed vascular plant divisions.		
		<b>Seed Plants</b>	Seed Germination	Identify and analyze the characteristics of seed plants.	Analyze the advantages of seed and fruit production.		
<b>Plant Structure and Function</b>							
		<b>Plant Cells and Tissues</b>		Identify the major types of plant cells.	Distinguish among the functions of the different types of plant tissues.		
		<b>Roots, Stems and Leaves</b>		Identify and compare the structures of roots, stems, and leaves.	Describe and compare the functions of roots, stems, and leaves.		
		<b>Plant Responses</b>		Identify the major types of plant hormones.	Identify and analyze the different types of plant responses.		
<b>Plant Reproduction</b>							
		<b>Life Cycles of Mosses, Ferns and Conifers</b>		Review the steps of alternation of generations.	Survey and identify methods of reproduction and the life cycles of mosses, ferns, and conifers.		
		<b>Flowers and Flowering</b>		Identify the organs of a flower.	Examine how photoperiodism influences flowering.		
		<b>The Life Cycle of a Flowering Plant</b>	Pollination: Flower to Fruit	Outline the processes in which cells differentiate during the formation of seeds and fruits and during seed germination.	Survey and identify the methods of reproduction, growth, and development in flowering plants.		
<b>Invertebrates</b>							
<b>Introduction to Animals</b>							

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		<b>Characteristics of Animals</b>		Identify the features that animals have in common.	Distinguish radial symmetry from bilateral symmetry.	Summarize the importance of a body cavity.	Identify how scientists determine evolutionary relationships among animals.
		<b>Animals Body Systems</b>		Summarize the functions of the digestive, respiratory, circulatory, nervous, skeletal, and excretory systems.	Compare a gastrvascular cavity with a one-way digestive system.	Differentiate open from closed circulatory systems.	Distinguish asexual from sexual reproduction.
<b>Simple Invertebrates</b>							
		<b>Sponges</b>		Summarize the general features of sponges.	Describe how sponge cells receive nutrients.	Describe how a sponge's body is structurally supported.	Distinguish between sexual and asexual reproduction in sponges.
		<b>Cnidarians</b>		Describe the two cnidarian body forms.	Summarize how cnidocytes function.	Summarize the life cycle of Obelia.	Compare three classes of cnidarians.
		<b>Flatworms and Roundworms</b>		Compare the three classes of flatworms.	Summarize the life cycle of a blood fluke.	Describe the body plan of a roundworm.	Summarize the life cycle of the roundworm Ascaris.
<b>Mollusks and Annelids</b>							
		<b>Mollusks</b>		Summarize the evolutionary relationship between mollusks and annelids.	Describe the key characteristics of mollusks.	Describe excretion, circulation, respiration, and reproduction in mollusks.	Compare the body plans and feeding adaptations of gastropods, bivalves, and cephalopods.
		<b>Annelids</b>		Identify the major change in body plan that distinguishes annelids from mollusks.	Describe the basic annelid body plan.	Describe the annelid digestive system.	Compare the three classes of annelids.
<b>Arthropods</b>							
		<b>Features of Arthropods</b>		Summarize the evolutionary relationship of arthropods and annelids.	Identify the three subphyla or arthropods.	Describe the characteristics of arthropods.	Describe how growth occurs in arthropods.
		<b>Spiders and Other Arachnids</b>		Summarize the characteristics of arachnids.	Identify the internal and external characteristics of brown recluse spiders.	Compare spiders, ticks, and mites.	Identify the health threats posed by some arachnids.

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		<b>Insects and Their Relatives</b>		Describe the characteristics of insects.	Compare complete and incomplete metamorphosis.	Identify the external and internal structures of the Eastern Lubber grasshopper.	Compare millipedes and centipedes with insects.
		<b>Crustaceans</b>		Summarize how crustaceans and insects are similar and dissimilar.	Describe the body plan of decapods.		
<b>Echinoderms and Invertebrate Chordates</b>							
		<b>Echinoderms</b>		Compare the developmental pattern found in protostomes with that found in deuterostomes.	Describe the major characteristics of echinoderms.	Summarize how the sea star's water vascular system functions.	
		<b>Invertebrate Chordates</b>		Describe the characteristics of chordates.	Define the term invertebrate chordate.	Compare tunicates and lancelets.	
<b>Vertebrates</b>							
<b>Fish and Amphibians</b>							
		<b>Fish</b>		Relate the structural adaptations of fishes to their environments.	Compare and contrast the characteristics of the different groups of fishes.	Interpret the phylogeny of fishes.	
		<b>Amphibians</b>		Relate the demands of a terrestrial environment to the adaptations of amphibians.	Relate the evolution of the three-chambered heart to the amphibian lifestyle.		
<b>Reptiles and Birds</b>							
		<b>Reptiles</b>		Explain how reptile adaptations make them suited to life on land.	Compare the characteristics of different groups of reptiles.		
		<b>Birds</b>		Explain how bird adaptations make them suited to life on land.	Relate bird adaptations to their ability to fly.	Interpret the phylogeny of birds.	
<b>Mammals</b>							

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		<b>Mammal Characteristics</b>		Distinguish mammalian characteristics.	Explain how the characteristics of mammals enable them to adapt to most habitats on Earth.		
		<b>Diversity of Mammals</b>		Distinguish among three groups of living mammals.	Compare reproduction in egg-laying, pouched, and placental mammals.		
<b>Animal Behavior</b>							
		<b>Innate Behavior</b>		Distinguish among the types of innate behavior.	Demonstrate, by example, the adaptive value of innate behavior.		
		<b>Learned Behavior</b>		Distinguish among types of learned behavior.	Demonstrate, by example, types of learned behavior.		
<b>The Human Body</b>							
<b>The Nervous System</b>							
		<b>Human Body Systems</b>	Human Homeostasis	Describe how the human body is organized.	Explain homeostasis.		
		<b>The Nervous System</b>	Sight vs. Sound Reflexes	Identify the functions of the nervous system.	Describe how a nerve impulse is transmitted.		
		<b>Divisions of the Nervous System</b>		Identify the functions of the central nervous system.	Describe the functions of the two divisions of the peripheral nervous system.		
		<b>The Senses</b>	Sound Beats and Sine Waves	Name the five types of sensory receptors.	Identify the five sense organs.		
		<b>Drugs and the Nervous System</b>	Drug Dosage	Name the different classes of drugs that directly affect the nervous system.	Describe the effect of alcohol on the body.		
<b>Skeletal, Muscular and Integumentary Systems</b>							
		<b>The Skeletal System</b>		State the functions of the skeletal system.	Describe the structure of a typical bone.	Explain how bones develop.	Identify the three different kinds of joints.
		<b>The Muscular System</b>		Describe the three types of muscle tissue.	Explain how muscles contract.	Explain why exercise is important.	

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		The Integumentary System		State the functions of the integumentary system.	Describe the structure of hair and nails.		
<b>Circulatory and Respiratory Systems</b>							
		The Circulatory System		Identify the functions of the human circulatory system.	Describe the structures of the circulatory system.	Name the three types of blood vessels in the circulatory system.	Describe blood pressure.
		Blood and the Lymphatic System		Describe blood plasma.	Explain the functions of red blood cells, white blood cells, and platelets.	Describe the role of the lymphatic system.	
		The Respiratory System		Describe respiration.	Identify the function of the respiratory system.	Describe gas exchange and breathing.	Explain how smoking affects the respiratory system.
<b>Digestive and Excretory Systems</b>							
		Food and Nutrition	Identifying Nutrients	Explain how food provides energy.	Describe the nutrients your body needs.	State why water is such an important nutrient.	Explain how to use the Food Guide Pyramid.
		The Process of Digestion		Identify the organs of the digestive system.	Describe the function of the digestive system.		
		The Excretory System	Dye Elimination	Identify the functions of the kidneys.	Explain how blood is filtered.		
<b>Endocrine and Reproductive Systems</b>							
		The Endocrine System		State the function of the endocrine system.	Describe hormones and glands.	Explain how the endocrine system maintains homeostasis.	
		Human Endocrine Glands		Identify the functions of the major endocrine glands.			
		The Reproductive System		Describe sexual development.	Explain the functions of the male and female reproductive systems.	Identify the four phases of the menstrual cycle.	
		Fertilization and Development		Describe fertilization.	Identify the stages of early development.	Describe the function of the placenta.	Outline the life cycle after birth.
<b>The Immune System and Diseases</b>							
		Infectious Disease	Disease Spread	Identify the causes of disease.	Explain how infectious diseases are transmitted.	Describe how antibiotics fight infection.	

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		<b>The Immune System</b>		Identify the body's nonspecific defenses against invading pathogens.	Describe the function of the immune system.		
		<b>Immune System Disorders</b>		State what happens when the immune system overreacts.	Explain what an autoimmune disease is.	Describe how HIV is transmitted and affects the immune system.	
		<b>The Environment and Your Health</b>		Identify environmental factors that affect your health.	Describe how you can maintain your health.		