



## AP DAILY VIDEOS

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# AP Biology

AP Daily is a series of on-demand, short videos—created by expert AP teachers and faculty—that can be used for in-person, online, and blended/hybrid instruction. These videos will cover every topic and skill outlined in the AP Course and Exam Description and launch on AP Classroom, unit-by-unit, on a rolling basis.

**Unit 1** RELEASE DATE: 9/1/2020

**Unit 2** RELEASE DATE: 9/22/2020

**Unit 3** RELEASE DATE: 10/1/2020

**Unit 4** RELEASE DATE: 10/22/2020

**Unit 5** RELEASE DATE: 11/10/2020

**Unit 6** RELEASE DATE: 12/8/2020

**Unit 7** RELEASE DATE: 1/11/2021

**Unit 8** RELEASE DATE: 2/10/2021

## Unit 1

Video Title	Topic	Video Focus	Instructor
1.1: Daily Video 1	Structure of Water and Hydrogen Bonding	The structure of water and the bonds involved in its function; the properties of water and how life depends on them.	Margaret Evans
1.2: Daily Video 1	Elements of Life	The atoms and molecules used to build biological molecules; how organisms exchange matter with the environment for survival.	Margaret Evans
1.3: Daily Video 1	Introduction to Biological Macromolecules	Hydrolysis, dehydration synthesis; the properties of monomers that allow them to form macromolecules.	Margaret Evans
1.4: Daily Video 1	Properties of Biological Macromolecules	How the structure and function of polymers are derived from the way their monomers are assembled; how monomers interact.	Margaret Evans
1.5: Daily Video 1	Structure and Function of Biological Macromolecules	The directionality of nucleic acid subunits; predicting the effects of changes in these subunits, using a visual representation.	Paulette Unger
1.5: Daily Video 2	Structure and Function of Biological Macromolecules	The directionality of protein subunits; modeling four elements of protein structure; predicting the effects of a change in subunit.	Paulette Unger
1.5: Daily Video 3	Structure and Function of Biological Macromolecules	The directionality of carbohydrate subunits; how changes in the subunits may lead to changes in carbohydrate structure or function.	Paulette Unger
1.6: Daily Video 1	Nucleic Acids	The structural similarities and differences among nucleic acid polymers, DNA, and RNA; relating the structure of nucleic acid polymers, DNA, and RNA to their respective functions.	Paulette Unger

## Unit 2

Video Title	Topic	Video Focus	Instructor
2.1: Daily Video 1	Cell Structure— Subcellular Components	This lesson will describe the structure and function of subcellular components and organelles.	Paulette Unger
2.2: Daily Video 1	Cell Structure and Function	This lesson will explain how subcellular components and organelles interact and contribute to the function of the cell. It will also practice making a scientific claim.	Paulette Unger
2.3: Daily Video 1	Cell Size	This lesson will explain the effect of surface area-to-volume ratios on the exchange of materials between cells and the environment. Calculations will be performed.	Paulette Unger
2.3: Daily Video 2	Cell Size	This lesson will discuss how specialized cell structures and strategies are used for the efficient exchange of molecules to the environment. A ratio will be calculated.	Paulette Unger
2.4: Daily Video 1	Plasma Membranes	This lesson will focus on the components that make up the cell membrane and how each helps to maintain the internal environment of the cell.	Kelcey Burris
2.5: Daily Video 1	Membrane Permeability	This lesson will focus on how the structure of biological molecules influences selective permeability, and the role of the cell wall in maintaining cell structure and function.	Kelcey Burris
2.6: Daily Video 1	Membrane Transport	The lesson will focus on the mechanisms that organisms use to maintain solute and water balance, and on the transport of large molecules across the plasma membrane.	Kelcey Burris
2.7: Daily Video 1	Facilitated Diffusion	This lesson will focus on how the structure of a molecule affects its ability to pass through the plasma membrane.	Kelcey Burris
2.8: Daily Video 1	Tonicity and Osmoregulation	This lesson will focus on how concentration gradients affect the movement of molecules across membranes.	Kelcey Burris
2.8: Daily Video 2	Tonicity and Osmoregulation	This lesson will focus on the skill of representing and describing data through constructing graphs, plots, and charts with a focus on osmolarity.	Kelcey Burris
2.8: Daily Video 3	Tonicity and Osmoregulation	This lesson will focus on how water moves by osmosis from areas of high water potential to areas of low water potential. Water potential will be calculated.	Kelcey Burris
2.9: Daily Video 1	Mechanisms of Transport	This lesson will focus on the processes that allow ions and other molecules to move across membranes.	Kelcey Burris
2.10: Daily Video 1	Cell Compartmentalization	This lesson will explain how internal membranes and membrane-bound organelles contribute to the compartmentalization of eukaryotic cell functions.	Paulette Unger
2.11: Daily Video 1	Origins of Cell Compartmentalization	This lesson will compare compartmentalization between prokaryotic and eukaryotic cells and discuss the evolution of membrane-bound organelles via endosymbiosis.	Paulette Unger

## Unit 3

Video Title	Topic	Video Focus	Instructor
3.1: Daily Video 1	Enzyme Structure	This lesson will focus on describing the chemical properties and function of enzymes. Concept explanation will be the skill practiced.	Kelcey Burris
3.2: Daily Video 1	Enzyme Catalysis	This lesson will focus on explaining how enzymes affect the rate of biological reactions.	Kelcey Burris
3.2: Daily Video 2	Enzyme Catalysis	This lesson will focus on the skill of identifying experimental procedures that are aligned with the question, including justifying controls.	Kelcey Burris
3.3: Daily Video 1	Environmental Impacts on Enzyme Function	This lesson will focus on explaining how changes to cellular environment and changes to enzyme structure affect enzyme function. Making predictions is the skill focus.	Kelcey Burris
3.4: Daily Video 1	Cellular Energy	This lesson will describe the role of energy in living organisms. Using reasoning to justify a claim is the skill focus.	Christopher Monsour
3.5: Daily Video 1	Photosynthesis	This lesson will explain how the process of photosynthesis allows organisms to capture and store energy. Supporting a scientific claim is the skill focus. (Part 1)	Christopher Monsour
3.5: Daily Video 2	Photosynthesis	This lesson will explain how the process of photosynthesis allows organisms to capture and store energy. Supporting a scientific claim is the skill focus. (Part 2)	Christopher Monsour
3.6: Daily Video 1	Cellular Respiration	This lesson will describe the processes that allow organisms to use energy stored in biological molecules. Constructing a graph, plot, or chart is the skill focus. (Part 1)	Christopher Monsour
3.6: Daily Video 2	Cellular Respiration	This lesson will describe the processes that allow organisms to use energy stored in biological molecules. (Part 2)	Christopher Monsour
3.6: Daily Video 3	Cellular Respiration	This lesson will describe the processes that allow organisms to use energy stored in biological molecules. (Part 3)	Christopher Monsour
3.7: Daily Video 1	Fitness	This lesson will explain the connection between variation in the number and types of molecules in cells to the ability of organisms to survive and/or reproduce in environments.	Kelcey Burris

## Unit 4

Video Title	Topic	Video Focus	Instructor
4.1: Daily Video 1	Cell Communication	This lesson will describe how cells communicate with one another over short and long distances. The skill will focus on explaining a biological concept or process.	Christopher Monsour
4.2: Daily Video 1	Introduction to Signal Transduction	This lesson will focus on the components of a signal transduction pathway. The skill will focus on describing a biological concept or process.	Christopher Monsour
4.3: Daily Video 1	Signal Transduction	This lesson will describe the role of the environment in eliciting a cellular response. The skill will focus on providing reasoning to justify a claim.	Christopher Monsour
4.4: Daily Video 1	Changes in Signal Transduction Pathways	This lesson will explain how changes in signaling molecule structure affect activity. The skill will focus on how to predict the effects of a change in a system based on a model.	Christopher Monsour
4.5: Daily Video 1	Feedback	This video will describe positive and negative feedback mechanisms and explain how they affect homeostasis. The skill will focus on predicting the causes or effects of a change.	Rachel Lytle
4.6: Daily Video 1	Cell Cycle	This lesson will describe the events that occur in the cell cycle. The skill will focus on calculating percentages.	Rachel Lytle
4.6: Daily Video 2	Cell Cycle	This lesson will explain how mitosis results in the transmission of chromosomes from one generation to the next. The skill will focus on describing data from a graph.	Rachel Lytle
4.7: Daily Video 1	Regulation of Cell Cycle	This video will describe the role of checkpoints in regulating the cell cycle and the effects of disruptions. The skill will focus on making predictions.	Rachel Lytle

## Unit 5

Video Title	Topic	Video Focus	Instructor
5.1: Daily Video 1	Meiosis	This video will compare mitosis and meiosis and explain how meiosis transmits chromosomes through generations. The key skill is explaining biological processes.	Rachel Lytle
5.2: Daily Video 1	Meiosis and Genetic Diversity	This video will explain how the process of meiosis generates genetic diversity. The key skill is identifying a testable question based on an observation, data, or a model.	Rachel Lytle
5.3: Daily Video 1	Mendelian Genetics	This video will explain how shared processes support the concept of common ancestry. The key skill is predicting the effect of a change to a biological system.	Rachel Lytle
5.3: Daily Video 2	Mendelian Genetics	This video will explain the inheritance of genes and traits as described by Mendel's laws.	Rachel Lytle
5.3: Daily Video 3	Mendelian Genetics	This video will focus on statistical tests and data analysis, specifically the skill of performing chi-square hypothesis testing.	Rachel Lytle
5.4: Daily Video 1	Non-Mendelian Genetics	This video will explain deviations from Mendel's model of the inheritance of traits to include linked genes and sex-linked traits. The skill will focus on calculating means.	Rachel Lytle
5.4: Daily Video 2	Non-Mendelian Genetics	This video will explain deviations from Mendel's model of the inheritance of traits, including multiple genes, physiological processes, and non-nuclear inheritance.	Rachel Lytle
5.5: Daily Video 1	Environmental Effects on Phenotype	This video will explain how environmental factors influence gene expression. The key skill is explaining biological processes in applied contexts.	Lisa Neesemann
5.6: Daily Video 1	Chromosomal Inheritance	This video will explain how inheritance of chromosomes results in variation. The skill is predicting causes of disruptions to biological systems using visual representations.	Lisa Neesemann
5.6: Daily Video 2	Chromosomal Inheritance	This video will explain how chromosomal analysis shows patterns of inheritance. The skill is predicting effects of disruptions to biological systems using visual representations.	Lisa Neesemann

## Unit 6

Video Title	Topic	Video Focus	Instructor
6.1: Daily Video 1	DNA and RNA Structure	This lesson will focus on DNA and RNA structure and how heritable information provides for continuity of life. The skill will focus on explaining biological concepts.	Lisa Neesemann
6.2: Daily Video 1	Replication	This lesson will focus on mechanisms used to copy and transmit genetic information. The skill will focus on explaining the relationships between biological concepts.	Lisa Neesemann
6.3: Daily Video 1	Transcription and RNA Processing	This lesson will focus on transcription and RNA processing. The skill will focus on explaining relationships represented visually in applied contexts.	Lisa Neesemann
6.3: Daily Video 2	Transcription and RNA Processing	This lesson will focus on describing the modifications made to mRNA after it is transcribed from DNA. The skill will focus on explaining relationships represented visually.	Lisa Neesemann
6.4: Daily Video 1	Translation	This lesson will focus on how genotypes determine the phenotypes of an organism. The skill will focus on representing relationships within biological models.	Lisa Neesemann
6.4: Daily Video 2	Translation	This lesson will focus on the salient features of translation. The skill will focus on predicting causes or effects of a change in a biological system.	Lisa Neesemann
6.5: Daily Video 1	Regulation of Gene Expression	This lesson will focus on the types of interactions that regulate gene expression. The skill will focus on making a scientific claim.	Tanea Hibler
6.5: Daily Video 2	Regulation of Gene Expression	This lesson will focus on the types of cellular interactions that regulate gene expression in eukaryotes and prokaryotes.	Tanea Hibler
6.6: Daily Video 1	Gene Expression and Cell Specialization	This lesson will focus on the binding of transcription factors to promoter regions and how this affects gene expression.	Tanea Hibler
6.7: Daily Video 1	Mutations	This lesson will focus on various types of mutations and how mutations affect nucleic acids, proteins, and phenotypes. The skill will focus on explaining biological concepts.	Tanea Hibler
6.7: Daily Video 2	Mutations	This lesson will focus on mutations and explain how changes in genotype may result in changes in phenotype.	Tanea Hibler
6.7: Daily Video 3	Mutations	This lesson will focus on explaining how alterations in DNA contribute to variations that can be subject to natural selection. The skill will focus on making observations.	Tanea Hibler
6.8: Daily Video 1	Biotechnology	This lesson will focus on techniques used to analyze or manipulate genomes. The skill focus is to explain relationships between experimental results and biological concepts.	Tanea Hibler

## Unit 7

Video Title	Topic	Video Focus	Instructor
7.1: Daily Video 1	Introduction to Natural Selection	This lesson will describe the causes of natural selection. The skill focus will be describing characteristics of a biological concept, process, or model.	Tanea Hibler
7.2: Daily Video 1	Natural Selection	This lesson will emphasize the importance of phenotypic variation in a population. The skill focus will be explaining biological concepts and/or processes.	Tanea Hibler
7.3: Daily Video 1	Artificial Selection	This lesson will describe how humans can affect diversity within a population. The skill focus will be describing data from a table or graph.	Tanea Hibler
7.4: Daily Video 1	Population Genetics	This lesson will explain how random occurrences affect the genetic makeup of a population. The skill focus will be stating the null or alternative hypothesis.	Kelcey Burris
7.5: Daily Video 1	Hardy-Weinberg Equilibrium	This lesson will focus on Hardy-Weinberg Equilibrium. The skill focus will be performing mathematical calculations using the Hardy-Weinberg Equation.	Kelcey Burris
7.6: Daily Video 1	Evidence for Evolution	This lesson will concentrate on types of data that provide evidence for evolution. The skill focus will be describing data from a table or graph, including identifying data points.	Kelcey Burris
7.7: Daily Video 1	Common Ancestry	This lesson will describe evidence for the common ancestry of all eukaryotes. The skill focus will be predicting the causes or effects of a change in a biological system.	Kelcey Burris
7.8: Daily Video 1	Continuing Evolution	This lesson will emphasize how evolution is an ongoing process in all living organisms. The skill focus will be proposing a new investigation.	Kelcey Burris
7.9: Daily Video 1	Phylogeny	The lesson will describe evidence that can be used to infer evolutionary relationships. The skill focus will be representing relationships with biological models.	Kelcey Burris
7.10: Daily Video 1	Speciation	This lesson will focus on speciation. The skill focus will be explaining relationships between different characteristics of biological concepts.	Kelcey Burris
7.11: Daily Video 1	Extinction	This lesson will concentrate on the role of extinctions within a changing environment. The skill focus will be stating the null and alternative hypotheses.	Tanea Hibler
7.12: Daily Video 1	Variations in Populations	This lesson will explain genetic diversity's impact on population dynamics. The skill focus will be providing reasoning to justify a claim.	Tanea Hibler
7.13: Daily Video 1	Origins of Life on Earth	This lesson will show the scientific evidence that provides support for models of origins of life. The skill focus will be stating the null and alternative hypotheses.	Tanea Hibler



## Unit 8

Video Title	Topic	Video Focus	Instructor
8.1: Daily Video 1	Responses to the Environment	This lesson will focus on an organism's response to environmental changes and how it affects overall fitness. The skill will focus on identifying experimental procedures.	Kelcey Burris
8.2: Daily Video 1	Energy Flow through Ecosystems	This lesson will focus on how energy flows through ecosystems and the impacts. The skill will focus on explaining relationships between experimental results and concepts.	Kelcey Burris
8.3: Daily Video 1	Population Ecology	This lesson will focus on the factors that influence the growth dynamics of populations. The skill will focus on representing and describing data.	Kelcey Burris
8.4: Daily Video 1	Effect of Density of Populations	This lesson will focus on how the density of a population affects and is determined by resource availability. The skill will focus on performing mathematical calculations.	Kelcey Burris
8.5: Daily Video 1	Community Ecology	This lesson will focus on the structure of a community and population interactions that influence structure. The skill will focus on using confidence intervals or error bars.	Margaret Evans
8.6: Daily Video 1	Biodiversity	This lesson will focus on describing relationships and explaining how changes in ecosystems affect structure. The skill will focus on predicting effects of change on a system.	Margaret Evans
8.7: Daily Video 1 (Skill 5.D)	Disruptions to Ecosystems	This lesson will focus on population interactions, invasive species, human activities, and other events that impact ecosystems. The skill will focus on evaluating hypotheses.	Margaret Evans