**AP Biology List of Topics & Videos/Animations:**

**Nature of Science:**

Designing an Experiment

Standard Deviation & Standard Error

<https://www.youtube.com/watch?v=09kiX3p5Vek>

 <https://www.youtube.com/watch?v=09kiX3p5Vek>

Chi Squared Analysis

 <http://www.bozemanscience.com/chi-squared-test>

**Evolution:**

5 ways to change the allele frequency

 <https://www.youtube.com/watch?v=5NdMnlt2keE>

Hardy-Weinberg equilibrium-conceptually

Natural Selection

 <http://www.bozemanscience.com/001-natural-selection>

 <http://www.bozemanscience.com/002-examples-of-natural-selection>

 <http://www.bozemanscience.com/026-behavior-and-natural-selection>

Genetic Drift

 <http://www.bozemanscience.com/003-genetic-drift>

Evidence for Evolution

 <http://www.bozemanscience.com/004-evidence-for-evolution>

 <http://www.bozemanscience.com/comparing-dna-sequences>

Phylogenetic Trees and Cladograms

 <http://www.bozemanscience.com/006-phylogenetics>

Speciation

 <http://www.bozemanscience.com/007-speciation-and-extinction>

 <http://www.bozemanscience.com/speciation>

**Biochemistry:**

Biomolecules

 <http://www.bozemanscience.com/042-biologoical-molecules>

Enzymes

 <http://www.bozemanscience.com/048-enyzmes>

[https://highered.mheducation.com/sites/9834092339/student\_view0/chapter6/how\_enzymes\_ work.html](https://highered.mheducation.com/sites/9834092339/student_view0/chapter6/how_enzymes_%20%20%20%20%20work.html)

<http://highered.mheducation.com/sites/0072507470/student_view0/chapter25/animation__enzyme_action_and_the_hydrolysis_of_sucrose.html>

Dehydration Synthesis & Hydrolysis

 <http://www.cengage.com/biology/discipline_content/animations/reaction_types.html>

Water & Properties of Water

 <http://www.bozemanscience.com/water-a-polar-molecule>

Surface area to volume ratios

 <https://www.youtube.com/watch?v=jw0ZHLJGVTY>

**The Cell:**

Parts & functions of the cell

 <http://www.bozemanscience.com/017-compartmentalization>

 <http://www.bozemanscience.com/043-cellular-organelles>

The Plasma Membrane

 <http://www.bozemanscience.com/015-cell-membrane>

<http://higheredbcs.wiley.com/legacy/college/voet/0470129301/guided_exp/guided_exploration_9/fluid_mosaic_animation.html>

Osmosis & Diffusion

<http://www.bozemanscience.com/016-transport-across-cell-membranes>

<http://highered.mheducation.com/sites/0072495855/student_view0/chapter2/animation__how_diffusion_works.html>

<http://highered.mheducation.com/sites/0072495855/student_view0/chapter2/animation__how_osmosis_works.html>

Cellular Respiration

 <http://www.bozemanscience.com/013-photosynthesis-and-respiration>

<http://www.phschool.com/atschool/phbio/active_art/cellular_respiration/>

<http://vcell.ndsu.nodak.edu/animations/glycolysis_overview/index.htm>

<http://vcell.ndsu.nodak.edu/animations/etc/>

Cell Cycle, Mitosis, & Meiosis

 <http://www.bozemanscience.com/028-cell-cycle-mitosis-and-meiosis>

 Mitosis: <http://vcell.ndsu.nodak.edu/animations/mitosis/index.htm>

 Meiosis: <http://vcell.ndsu.nodak.edu/animations/meiosis/index.htm>

**Molecular Genetics:**

DNA Replication

 <http://www.bozemanscience.com/027-part-1-dna-rna>

<http://highered.mheducation.com/sites/0072943696/student_view0/chapter3/animation__dna_replication__quiz_1_.html>

Transcription

 <http://www.bozemanscience.com/027-part-2-dna-rna>

 <http://vcell.ndsu.nodak.edu/animations/transcription/index.htm>

Translation

 <http://www.bozemanscience.com/027-part-2-dna-rna>

 <http://www.bozemanscience.com/032-signal-transmission-and-gene-expression>

 <http://vcell.ndsu.nodak.edu/animations/translation/index.htm>

Mutation

Gene Regulation

 <http://www.bozemanscience.com/031-gene-regulation>

<https://highered.mheducation.com/sites/9834092339/student_view0/chapter15/simple_gene_expression.html>

<https://highered.mheducation.com/sites/9834092339/student_view0/chapter16/control_of_gene_expression_in_eukaryotes.html>

Biotechnology (transformation, electrophoresis, etc…)

 <http://www.bozemanscience.com/ap-bio-lab-6-molecular-biology>

Genetic Engineering-pros and cons

Viruses

 <http://www.bozemanscience.com/035-viral-replication>

<http://highered.mheducation.com/sites/0072995246/student_view0/chapter8/lambda_phage_replication_cycle.html>

HIV: <http://www.hhmi.org/biointeractive/hiv-life-cycle>

**Mendelian Genetics:**

Monohybrid Cross & Dihybrid Cross

 <http://www.bozemanscience.com/029-mendelian-genetics>

 <http://www.bozemanscience.com/033-genotypes-and-phenotypes>

Pedigrees

Non-Mendelian Traits/Sex-linked traits

 <http://www.bozemanscience.com/030-advanced-genetic>

Gene Mapping/linked genes

<https://www.youtube.com/watch?v=rzF6nG4C0nc>

**Plants & Photosynthesis:**

[**https://biomanbio.com/HTML5GamesandLabs/PhotoRespgames/photointeractivehtml5page.html**](https://biomanbio.com/HTML5GamesandLabs/PhotoRespgames/photointeractivehtml5page.html)

Light Dependent Reactions

 <http://www.bozemanscience.com/013-photosynthesis-and-respiration>

 <http://www.science.smith.edu/departments/Biology/Bio231/ltrxn.html>

Light Independent Reactions/Calvin Cycle

 <http://www.bozemanscience.com/013-photosynthesis-and-respiration>

<https://highered.mheducation.com/sites/9834092339/student_view0/chapter39/calvin_cycle.html>

Plant structure & Behavior

 <http://www.bozemanscience.com/023-plant-and-animal-defense>

**Body Systems:**

Cell signaling & Communication

 <http://www.bozemanscience.com/positive-and-negative-feedback-loops>

 <http://www.bozemanscience.com/019-response-to-external-envirnoments>

 <http://www.bozemanscience.com/024-development-timing-and-coordination>

 <http://www.bozemanscience.com/025-mechanisms-of-timing-and-control>

 <http://www.bozemanscience.com/032-signal-transmission-and-gene-expression>

 <http://www.bozemanscience.com/037-cell-communication>

<http://www.wiley.com/legacy/college/boyer/0470003790/animations/signal_transduction/signal_transduction.htm>

The Endocrine System

<http://highered.mheducation.com/sites/0072495855/student_view0/chapter20/animation__hormonal_communication.html>

The Nervous System

 <http://www.bozemanscience.com/nervous-system>

<http://highered.mheducation.com/sites/0072495855/student_view0/chapter14/animation__the_nerve_impulse.html>

<http://highered.mheducation.com/sites/0072495855/student_view0/chapter2/animation__how_the_sodium_potassium_pump_works.html>

The Immune System

 <http://www.bozemanscience.com/023-plant-and-animal-defense>

<http://highered.mheducation.com/sites/0072507470/student_view0/chapter22/animation__the_immune_response.html>

**Ecology:**

9th grade Ecology topics

 <http://www.bozemanscience.com/046-communities>

 <http://www.bozemanscience.com/047-ecosystems>

 <http://www.bozemanscience.com/050-populations>

 <http://www.bozemanscience.com/055-biodiversity>

Population Growth

 <https://paul-andersen.squarespace.com/exponential-growth>

 <http://www.bozemanscience.com/logistic-growth>

Invasive Species

**General Resources:**

All of the AP Biology Bozeman Biology videos: <http://www.bozemanscience.com/ap-biology/>

Virtual Cell Animation Collection: <http://vcell.ndsu.nodak.edu/animations/>

Crash Course Biology: <http://thecrashcourse.com/courses/biology>

Crash Course: Ecology: <http://thecrashcourse.com/courses/biology>

 Note: not all topics covered in Crash Course are Applicable to AP Biology