

# 4. Metabolism

Content Area: **Science**  
Course(s): **Generic Course**  
Time Period: **Marking Period 2**  
Length: **4 weeks**  
Status: **Published**

## Standards

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AP Biology Essential Knowledge Standards:

1B.1, 1D.2

2A.1, 2A.2, 2A.3, 2C.1, 2C.2, 2D.1, 2D.3, 2E.1,

3B.2,

4A.1, 4A.2, 4A.4, 4B.1, 4B.2, 4C.1

## Goals/Objectives

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Learning Objectives:

**LO 2.1** The student is able to explain how biological systems use free energy based on empirical data that all organisms require constant energy input to maintain organization, to grow and to reproduce. [See **SP 6.2**]

**LO 2.2** The student is able to justify a scientific claim that free energy is required for living systems to maintain organization, to grow or to reproduce, but that multiple strategies exist in different living systems. [See **SP 6.1**]

**LO 2.3** The student is able to predict how changes in free energy availability affect organisms, populations and ecosystems. [See **SP 6.4**]

**LO 4.17** The student is able to analyze data to identify how molecular interactions affect structure and function. [See **SP 5.1**]

**LO 2.4** The student is able to use representations to pose scientific questions about what mechanisms and structural features allow organisms to capture, store and use free energy. [See **SP 1.4, 3.1**]

**LO 2.5** The student is able to construct explanations of the mechanisms and structural features of cells that allow organisms to capture, store or use free energy. [See **SP 6.2**]

**LO 2.4** The student is able to use representations to pose scientific questions about what mechanisms and structural features allow organisms to capture, store and use free energy. [See **SP 1.4, 3.1**]

**LO 2.5** The student is able to construct explanations of the mechanisms and structural features of cells that allow organisms to capture, store or use free energy. [See **SP 6.2**]

## **Content**

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- Biological Energetic
- Enzyme Structure & Function
- Chemoheterotrophic Nutrition:
- Fermentation & Aerobic
- Respiration Photoautotrophic
- Nutrition: Photosynthesis

## **Skills**

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### **Science Skills Practices for AP Biology**

- use representatives and models to communicate scientific phenomena and solve problems
- use mathematics appropriately
- engage in scientific questioning to extend thinking or to guide investigations
- plan and implement data collection
- perform data analysis and evaluation
- work with scientific explanations and theories
- connect and relate knowledge across various scales, concepts, and representations in and across domains.