### Central Learning Goals

#### Metacognitive
- Improve your ability to work productively and cooperatively with others towards a common goal
- Become a self-actualized learner (learn how to learn)
- Accurately evaluate your understanding of content and the process of science
- Develop confidence in your knowledge and abilities

#### Content
- Use the principles of evolution to explain the diversity of life
- Describe fundamental biological structures and processes
- Describe the flow of energy and matter in biological systems
- Use your knowledge of processes to explain patterns across multiple temporal and spatial scales

#### Process
- Engage in observation-discovery and hypothesis-driven studies of biology
- Collaborate with people of varying knowledge and points of view towards common goals
- Effectively communicate scientific content, methods and thinking
- Decipher, assess the validity, and gauge the uncertainty of scientific claims
Metacognitive Learning Goals

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Content Learning Goals

- Use phylogeny and fossils for inferring the history of life
- Recognize taxa (species, genera, families, etc.) based on traits
- Know a single taxon (or small set of taxa) well
- Evaluate the human impact on the ecology and evolution of other species
- Evaluate the human impact on the ecology and evolution of other species
- Use the principles of evolution to explain the diversity of life
- Describe the flow of nutrients (e.g. N and P) in an ecosystem
- Use data to show genetic information is stored, processed, expressed and manipulated
- Describe the structure and function of molecules, cells, tissues, organs, individuals, and/or communities
- Describe fundamental biological structures and processes
- Describe the flow of energy and matter in biological systems
- Use your knowledge of processes to explain patterns across multiple temporal and spatial scales
- Use data and theory to illustrate the influence of diversity on productivity and productivity on diversity
- Illustrate how ancestry and mutation influence structure and function across different scales (from molecules to whole organisms)
- Model or illustrate how life history traits, competition, predation, and niche effects can influence the abundance and distribution of species
- Use data and theory to illustrate the influence of diversity on productivity and productivity on diversity
- Relate the distribution of resources to the variation in abundance of individuals in a population
- Show how organization and function of organisms emerges as a consequence of development
- Use theory and empirical data for explaining that evolution happens as a consequence of mutation, drift, and selection
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Process Skills Learning Goals

Engage in observation-discovery and hypothesis-driven studies of biology

- Use statistics appropriately
- Make inferences from phylogenies
- Use the comparative method
- Develop different problem-solving strategies
- Map data for visualizing spatial patterns or solving problems
- Confidently collect and manipulate data
- Construct and annotate a genome
- Develop computer, lab, and/or field skills
- Confidently use R (or another computational environment) to manipulate, visualize and analyze data
- Decipher, assess the validity, and gauge the uncertainty of scientific claims
- Distinguish between claims based on scientific evidence and other types of claims
- Judge and critique the reliability, sufficiency, and/or authenticity of information
- Evaluate acceptance of evolution
- Communicate the applications of biology for social, ethical and environmental issues
- Effectively argue the relevance of biology to diverse audiences
- Demonstrate awareness of the ways context, audience, and purpose drive content, presentation, and stylistic choices

Collaborate with people of varying knowledge and points of view towards common goals

- Propose an informed hypothesis to explain observations
- Design an experiment to test a specific hypothesis
- Construct and evaluate models
- Use and interpret models, data or simulations to make predictions
- Use statistics appropriately
- Construct logical-deductive arguments based on evidence

Effectively communicate scientific content, methods and thinking

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Participate in department, college, local or regional scientific communities

- Interact with peers and share information and skills
- Seek out the assistance of expert individuals
- Make and solidify interpersonal connections that stem from preparedness and participation in the sociology of science
- Propose an informed hypothesis to explain observations
- Design an experiment to test a specific hypothesis
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- Use and interpret models, data or simulations to make predictions
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EBIO

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- Propose an informed hypothesis to explain observations
- Design an experiment to test a specific hypothesis
- Construct and evaluate models
- Use and interpret models, data or simulations to make predictions
- Use statistics appropriately
- Construct logical-deductive arguments based on evidence
Engage in observation-discovery and hypothesis-driven studies of biology

Correctly interpret graphical, tabular, and text-based description of data

Identify social influences on scientific pursuits or acceptance of science

Judge and critique the reliability and authenticity of information

Evaluate acceptability of evolution

Distinguish between claims based on scientific evidence and other types of claims

Decipher, assess the validity, and gauge the uncertainty of scientific claims

Confidently collect and manipulate data

Use and interpret models, data or simulations to make predictions

Use GIS to map vegetation and design restoration projects

Construct a genome

Use the comparative method

Design an experiment to test a specific hypothesis

Construct and evaluate models

Develop different problem-solving strategies

Make inferences from phylogenies

Use statistics appropriately

Develop computer, lab, and/or field skills

Construct logical-deductive arguments based on evidence

Effectively argue the relevance of biology to diverse audiences

Communicate the applications of biology for social, ethical and environmental issues

Effectively communicate scientific content, methods and thinking

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Make inferences from phylogenies

Use statistics appropriately

Use GIS to map vegetation and design restoration projects

Construct an annotate a genome

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Expert consultation is provided.

Climate change (RS)

Gen Bio (BM, RS, DM, WA)

Intro Quant (BM, AM)

Animal evo-devo (DM)

Evolution (AM, NK)

Plant systematics (ET)

Behavior (MB)

Modeling (SF)

Genomics (NK)

Phylogenetics (SS)

Scientific writing (HC)

Landscape ecology (CW)

Genetically Engineered Organisms (WA)

Community ecology (KD)