

SRPSD Biology 30 Rubrics

Student-Directed Study

BI30-SDS1 Create and carry out a plan to explore one or more topics of personal interest relevant to Biology 30 in depth.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I can identify a personally relevant or interesting topic and develop a proposal for a scientific investigation, or a plan for an experiment, using the scientific method.	I can assemble a product demonstrating an understanding of a Biology 30 related topic of interest.	I can demonstrate a deep understanding of my topic.	I can use my deep understanding to show how my topic impacts myself, society, and/or the scientific community.

Life and Evolution

BI30-LE1 Explore how scientific understandings of life and its characteristics change in light of new evidence.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I can identify the characteristics of living things. I know cell theory.	I can explain the characteristics of living things and the definition of life based on a cultural perspective.	I can show an overall understanding of how scientists and technology have contributed to our understanding of the definition of life. I can defend a position on life related issues.	I can provide a detailed explanation of how scientists and technology have contributed to our understanding of the definition of life.

BI30-LE2 Examine the significance of evolution as a key unifying theme in biology through the principles, processes and patterns of biological evolution.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I can define evolution. I can explain the theory of natural selection.	I can explain some processes (natural selection and genetic drift) and patterns (cladograms and phylogenetic trees) of evolution. I can explain some of the evidence that supports evolution.	I can explain all the patterns and processes of evolution. I can explain all of the evidence that supports evolution.	I can use the patterns and processes of evolution to explain the importance of evolution to biology.

Organization of Life

BI30-OL1 Investigate cell structure and processes, including energy transfer, and transport of materials, in unicellular and multicellular organisms which are representative of each kingdom.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I can explain how cells are different through their structure.	I can explain how cells are different through their processes.	I can discuss cell structure and processes, including energy transfer and material transport in a variety of organism's representative of each kingdom.	I can relate cell structure and processes to evolutionary change.

BI30-OL2 Compare the anatomies, physiologies and behaviours of multicellular organisms including protists, fungi, plants and animals.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I can identify/differentiate protists, fungi, plants, and animals.	I can do a basic comparison of protists, fungi, plants, and animals.	I can compare in detail protists, fungi, plants, and animals based on reproduction, defense, movement, response to stimuli, homeostasis, and material transport.	I can explain advantages and disadvantages of certain processes, such as reproduction, defense, movement, response to stimuli, homeostasis, and material transport.

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BI30-OL3 Explore how the dynamic nature of biological classification reflects advances in scientific understanding of relationships among organisms.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I understand how to classify living things. I can interpret a dichotomous key.	I can create a dichotomous key. I can explain the importance of Linnaeus' work.	I understand the system of classification is ever changing.	I can explain the challenges of classifying organisms.

Genetics and Biotechnology

BI30-GB1 Explore classical (i.e. Mendelian) and current (i.e. chromosomal) understandings of biological inheritance.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I know genetic information is inherited and can define basic genetic terminology. I can interpret a karyotype.	I can complete simple, complete dominance genetics crosses using Punnett squares. I can predict the genotypic and phenotypic ratios of these crosses. I know what P, F1 and F2 generations are. I can do crosses involving blood types.	I can complete simple dihybrid dominance crosses using Punnett squares. I can predict the genotypic and phenotypic ratios of these crosses. I know the difference between incomplete and co-dominance. I can complete crosses with incomplete dominance, co-dominance and multiple alleles. I can complete monohybrid sex-linked crosses and predict their genotypic and phenotypic ratios. I can interpret pedigrees.	I can interpret genotypic and phenotypic ratios from non-simple dominance questions (combinations of co-dominance/incomplete and complete dominance). I can explain how meiosis leads to increases in genetic variation.

BI30-GB2 Investigate how genetic information is stored, transmitted and expressed at the molecular level.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I know what RNA and DNA stand for. I know what genes and codons are. Given a DNA strand, I can write the complementary strand.	I know the 3 types of RNA. I can explain the structure of DNA. I can explain the differences between RNA and DNA. Given a DNA strand I can write the corresponding mRNA and tRNA strands.	I can explain how DNA is "read". I can recognize various types of gene mutations (e.g., deletion, insertion, inversion, translocation and frameshift) and how they may lead to genetic disorders. I can explain how proteins are made (transcription and translation) I know the 3 types of RNA and can explain their role in protein synthesis. I can explain how DNA is replicated, proofread and fixed.	I can assess the importance of the structure of the DNA molecule to its capacity for storage, transmission, and expression of genetic information. I can assess the importance of the process of DNA replication. I can explain the role of genetic mutation in evolution.

BI30-GB3 Explore the impacts of historical, current and emerging biotechnologies on self, society and the environment.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I can give examples of biotechnologies that impact me, society, and the environment. I can explain an example of a biotechnology.	I can identify the positive and negative impacts of one biotechnology on society and the environment.	I can explain why there is controversy surrounding biotechnology (societal pressure, people's perceptions, regulations and legislation, media's role in spinning biotechnology).	I can use my knowledge to defend a position related to the impacts of biotechnology on self, society, and the environment.