

STANDARD NAME	STANDARD DEFINITION	ADVANCED	PROFICIENT	DEVELOPING	EMERGING
Ecology					
SC.EC.B.01.02	Relates the carbon cycle to global climate change and recognizes all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy	<ul style="list-style-type: none"> *Describes the role of the carbon cycle in global climate change *Describes the trends in atmospheric carbon over 50 years *Describes the process and benefits of transfer of energy in an ecosystem *Describes the process and benefits of transformation of matter within an ecosystem 	<ul style="list-style-type: none"> *Describes the role of the carbon cycle in global climate change *Describes the process of energy transfer in an ecosystem *Describes the process of transformation of matter within an ecosystem 	<ul style="list-style-type: none"> *Describes the role of the carbon cycle in global climate change *Identifies the process of energy transfer in an ecosystem *Identifies the process of transformation of matter within an ecosystem 	<ul style="list-style-type: none"> *Identifies the role of the carbon cycle in global climate change
SC.EC.B.02.02	Explores ecological relationships in aquatic and terrestrial ecosystems (e.g. competition, niche, predator/prey, symbiosis) and analyzes the energy transfer within these ecosystems.	<ul style="list-style-type: none"> *Describes two aquatic ecosystems *Describes two terrestrial ecosystems *Analyzes the energy flow, predator/prey interactions, symbiosis and competition in all ecosystems described *Presents ecosystem research to members of the community 	<ul style="list-style-type: none"> *Describes an aquatic ecosystem *Describes a terrestrial ecosystem *Illustrates the process of energy flow, predator/prey interactions, symbiosis and competition in all ecosystems described *Presents ecosystem research to a group of peers 	<ul style="list-style-type: none"> *Describes an aquatic ecosystem *Describes a terrestrial ecosystem *Presents ecosystem research to a group of peers 	<ul style="list-style-type: none"> *Identifies an aquatic ecosystem *Identifies a terrestrial ecosystem
SC.EC.B.03.02	Analyzes the potential impacts of changes (e.g. climate change, habitat loss/gain, cataclysms, human activities) within an ecosystem	<ul style="list-style-type: none"> *Describes the dynamic properties of four ecosystems which have been impacted by large scale disturbances *Analyzes potential effects of large scale disturbances in ecosystem balance *Presents analysis to members of the community 	<ul style="list-style-type: none"> *Describes the dynamic properties of two ecosystems which have been impacted by large scale disturbances *Analyzes potential effects of large scale disturbances in ecosystem balance *Presents analysis to a group of peers 	<ul style="list-style-type: none"> *Describes the dynamic properties of one ecosystem which has been impacted by large scale disturbances *Analyzes potential effects of large scale disturbances in ecosystem balance 	<ul style="list-style-type: none"> *Identifies the dynamic properties of one ecosystem which has been impacted by large scale disturbances

SC.EC.B.04.02	Examines population growth (density, growth rate, carrying capacity) and identifies the impact on energy requirements.	*Mathematically describes the trends in population dynamics *Compares growth rates to carrying capacity, energy flow, and density	*Identifies the trends in population dynamics *Compares growth rates to carrying capacity, energy flow, and density	*Identifies trends in population dynamics *Compares growth rates to carrying capacity, energy flow, or density	*Compares growth rates to carrying capacity, energy flow, or density
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Genetics and Evolution

SC.GE.B.01.02	Relates the structure of DNA to characteristics of an organism	*Describes how the structure of DNA determines characteristics of an organism *Identifies 5 characteristics of 2 different organisms and describes structure of DNA for each	*Describes how the structure of DNA determines characteristics of an organism *Identifies characteristics of organisms and describes structure of DNA	*Identifies characteristics of organisms and describes structure of DNA	*Understands that the structure of DNA is related to the characteristics of an organism
SC.GE.B.02.02	Researches how the processes of natural selection cause changes in species over time	*Describes natural selection *Describes speciation *Identifies multiple events which lead to a single outcome (bottleneck, isolation, competition, introduced and invasive species, etc) *Describes the work of Charles Darwin and Alfred Russel Wallace	*Describes natural selection *Describes speciation *Identifies multiple events which lead to a single outcome (bottleneck, isolation, competition, introduced and invasive species, etc)	*Describes natural selection *Describes speciation *Identifies the role of the following in speciation: bottleneck, isolation, competition, introduced and invasive species	*Defines natural selection *Defines speciation
SC.GE.B.03.02	Researches and explains practical applications of genetic engineering	*Conducts research on 4 applications of biotechnology *Describes the societal demands for biotechnology *Identifies potential impacts which biotechnology has on natural selection *Compares benefits and costs of biotechnology *Presents research to members of the community	*Conducts research on 2 applications of biotechnology *Describes the societal demands for biotechnology *Identifies potential impacts which biotechnology has on natural selection *Compares benefits and costs of biotechnology *Presents research to a group of peers	*Conducts research on 1 application of biotechnology *Describes the societal demands for biotechnology *Compares benefits and costs of biotechnology	*Conducts research on 1 application of biotechnology

SC.GE.B.04.02	Compare and contrast the stages of mitosis and meiosis	<ul style="list-style-type: none"> *Illustrates and describes the stages of meiosis *Illustrates and describes the stages of mitosis *Identifies the purpose of each process 	<ul style="list-style-type: none"> *Describes the stages of meiosis *Describes the stages of mitosis *Identifies the purpose of each process 	<ul style="list-style-type: none"> *Describes the stages of meiosis *Describes the stages of mitosis 	<ul style="list-style-type: none"> *Describes the stages of meiosis or mitosis
SC.GE.B.05.02	Explains how DNA replication and RNA transcription relate to inheritance	<ul style="list-style-type: none"> *Describes and illustrates DNA replication *Describes and illustrates RNA transcription *Describes and illustrates the role each process plays in inheritance 	<ul style="list-style-type: none"> *Describes and illustrates DNA replication *Describes and illustrates RNA transcription *Describes the role each process plays in inheritance 	<ul style="list-style-type: none"> *Describes DNA replication *Describes RNA transcription 	<ul style="list-style-type: none"> *Describes DNA replication or RNA transcription

Living Organisms: structure, function, behavior, development, life cycles, and diversity

SC.LO.B.01.02	Describes the learned behaviors (e.g. classical conditioning, imprinting, trial and error) that are utilized by living organisms to meet the requirements of life	<ul style="list-style-type: none"> *Describes the four basic requirements of life *Describes learned behaviors such as conditioning, imprinting and trial and error in five phyla *Describes how these behaviors are used by organisms to meet the basic requirements of life 	<ul style="list-style-type: none"> *Describes the four basic requirements of life *Describes learned behaviors such as conditioning, imprinting and trial and error in species from three phyla *Describes how these behaviors are used by organisms to meet the basic requirements of life 	<ul style="list-style-type: none"> *Describes the four basic requirements of life *Describes learned behaviors such as conditioning, imprinting and trial and error in species from one phylum 	<ul style="list-style-type: none"> *Describes the four basic requirements of life
SC.LO.B.02.02	Compares and contrasts the structure-function relationship of structures within the body (such as joints, muscles, and lungs) between different living organisms	<ul style="list-style-type: none"> *Examines and describes multiple systems of organisms from five different phyla *Compares and contrasts methods of obtaining and using energy among phyla *Describes the structure-function relationship of five different organs within the human body 	<ul style="list-style-type: none"> *Examines and describes multiple systems of organisms from three different phyla *Compares and contrasts methods of obtaining and using energy among phyla *Describes the structure-function relationship of three different organs within the human body 	<ul style="list-style-type: none"> *Describes multiple systems of organisms from two different phyla *Describes the structure-function relationship of two different organs within the human body 	<ul style="list-style-type: none"> *Describes multiple systems of an organism *Describes the structure-function relationship of an organ within the human body

SC.LO.B.03.02	Identifies and explains the function of cell organelles in plants and animals, and explains why some organelles are different between plants and animals	<ul style="list-style-type: none"> * Describes the function of cell organelles in both plants and animals *Describes why some organelles are only found in a plant or animal cell and explains why those organelles are not necessary for the other type of cell *Illustrates a comparison of plant and animal cells 	<ul style="list-style-type: none"> * Describes the function of cell organelles in both plants and animals *Describes why some organelles are only found in a plant or animal cell and explains why those organelles are not necessary for the other type of cell 	<ul style="list-style-type: none"> * Describes the function of cell organelles in both plants and animals *Explains why some organelles are only found in a plant or animal cell 	<ul style="list-style-type: none"> * Describes the function of cell organelles in both plants and animals
SC.LO.B.04.02	Describes the functions and interdependencies of the organs within the immune system and within the endocrine system	<ul style="list-style-type: none"> *Describes the function of organs in the immune system *Describes the function of glands and organs of the endocrine system *Describes the interdependency of organs in both the endocrine and the immune system *Investigates immune and endocrine disorders *Present investigation to a group of community members 	<ul style="list-style-type: none"> *Describes the function of organs in the immune system *Describes the function of glands and organs of the endocrine system *Describes the interdependency of organs in both the endocrine and the immune system *Lists common immune and endocrine disorders 	<ul style="list-style-type: none"> *Identifies the function of organs in the immune system *Identifies the function of glands and organs of the endocrine system *Identifies the interdependency of organs in both the endocrine and the immune system 	<ul style="list-style-type: none"> *Identifies the function of organs in the immune system *Identifies the function of glands and organs of the endocrine system

Viruses and Bacteria

SC.VB.B.01.02	Identifies and researches common diseases and beneficial effects of viruses and bacteria	<ul style="list-style-type: none"> *Describes common uses of viruses and bacteria, and discusses current experiments and future uses *Researches 4 common diseases caused by viruses and bacteria 	<ul style="list-style-type: none"> *Describes common uses of viruses and bacteria such as food and medical uses *Researches a common disease caused by viruses or bacteria 	<ul style="list-style-type: none"> *Understands that viruses and bacteria help to make products used in daily life *Identifies a common disease caused by viruses or bacteria 	<ul style="list-style-type: none"> *Understands that viruses and bacteria help to make products used in daily life
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SC.VB.B.02.02	Describe the replication of viruses and bacteria, and explain ways to combat their proliferation	<ul style="list-style-type: none"> *Describes how viruses and bacteria reproduce/replicate *Compares and contrasts virus and bacteria growth *Researches and describes the function/structure relationship of 2 specific viruses and 2 specific bacteria *Describes ways to combat proliferation of 2 viruses and 2 bacteria 	<ul style="list-style-type: none"> *Describes how viruses and bacteria reproduce/replicate *Researches and describes the function/structure relationship of 1 specific virus and 1 specific bacterium *Describes ways to combat proliferation of 1 virus and 1 bacterium 	<ul style="list-style-type: none"> *Describes how viruses and bacteria reproduce/replicate *Describes ways to combat proliferation of 1 virus and 1 bacterium 	<ul style="list-style-type: none"> *Describes ways to combat proliferation of 1 virus and 1 bacterium
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Scientific Process

SC.SP.B.01.02	Develops testable questions independently and as a group, based on predictions, observations, and inferences from past experiences and research. Hypothesizes about the outcome of the experiment using information gathered from relevant sources	<ul style="list-style-type: none"> *Develops testable questions independently and defends methods to community members *Develops and defends testable questions as a group *Constructs valid hypotheses based on predictions, observations, research and inferences *Defends hypothesis based on prior experiences and research *Includes valid citation of sources 	<ul style="list-style-type: none"> *Develops testable questions independently and defends methods to a group of peers *Develops and defends testable questions as a group *Constructs valid hypotheses based on predictions, observations, research and inferences *Defends hypothesis based on prior experiences and research *Includes citation of sources 	<ul style="list-style-type: none"> *Develops testable questions independently *Develops testable questions as a group *Constructs valid hypotheses based on predictions, observations, research or inferences *Describes hypothesis based on prior experiences 	<ul style="list-style-type: none"> *Develops testable questions independently *Develops testable questions as a group *Describes hypothesis based on prior experiences
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SC.SP.B.02.02	Designs and conducts an experiment, and gathers relevant data with the intent of solving or answering the proposed question	<ul style="list-style-type: none"> *Designs an experiment with a clearly defined problem or question *Collects relevant data to answer the question *Formulates potential solution based on research *Defends outcome of experiment to peers 	<ul style="list-style-type: none"> *Designs an experiment with a clearly defined problem or question *Collects relevant data to solve the problem or answer the question *Formulates potential solution based on research 	<ul style="list-style-type: none"> *Designs an experiment with a defined question *Collects data to answer the question 	<ul style="list-style-type: none"> *Designs an experiment *Collects data
SC.SP.B.03.02	Analyzes data, makes inferences and develops models to represent the data collected	<ul style="list-style-type: none"> *Analyzes collected data using three appropriate statistical methods *Communicates analysis using models and appropriate scientific language to members of the community *Presents models used to represent data to members of the community 	<ul style="list-style-type: none"> *Analyzes collected data using two appropriate statistical methods *Communicates analysis using models and appropriate scientific language to a group of peers *Presents models used to represent data to a group of peers 	<ul style="list-style-type: none"> *Analyzes collected data using an appropriate statistical method *Communicates analysis using appropriate scientific language to a group of peers 	<ul style="list-style-type: none"> *Analyzes collected data using a statistical method *Communicates analysis to a group of peers
SC.SP.B.04.02	Communicates entire process used in experiment, as well as results and models to depict data and conclusions	<ul style="list-style-type: none"> *Describes each step of the research process including methods and results *Presents models used to depict data, analysis, and conclusion to a group of peers 	<ul style="list-style-type: none"> *Describes each step of the research process including methods and results *Presents models used to depict data, analysis, and conclusion to a group of peers 	<ul style="list-style-type: none"> *Describes some steps of the research process *Presents models used to depict data, analysis, and conclusion to a group of peers 	<ul style="list-style-type: none"> *Describes some steps of the research process
SC.SP.B.05.02	Recognizes and analyzes multiple explanations and models, using this information to revise own explanation or model if necessary	<ul style="list-style-type: none"> *Examines three models and describes three multiple ways each model can be interpreted *Revises own model from previous experiment based on an alternative way to interpret the model 	<ul style="list-style-type: none"> *Examines two models and describes two ways the model can be interpreted *Revises own model from previous experiment based on an alternative way to interpret the model 	<ul style="list-style-type: none"> *Examines one model and describes one way the model can be interpreted *Attempts to revise own explanation using an alternative model 	<ul style="list-style-type: none"> *Examines one model and describes one way the model can be interpreted

SC.SP.B.06.02	Evaluates the credibility of cited sources when conducting own scientific investigation	<ul style="list-style-type: none"> *Includes ten sources of information in a scientific investigation *Evaluates the credibility of these sources based on peer reviewed article 	<ul style="list-style-type: none"> *Includes eight sources of information in a scientific investigation *Evaluates the credibility of these sources based on peer reviewed article 	<ul style="list-style-type: none"> *Includes five sources of information in a scientific investigation 	<ul style="list-style-type: none"> *Includes three sources of information in a scientific investigation
SC.SP.B.07.02	Conducts research and communicates results to solve a problem within the local environment (e.g. fish and game management, building permits, mineral rights, land use policies)	<ul style="list-style-type: none"> *Conducts an investigation of a local issue *Presents a potential solution to a local issue based on research *Communicates solution to two or more specified interest groups 	<ul style="list-style-type: none"> *Conducts an investigation of a local issue *Presents a potential solution to a local issue based on research *Communicates solution a specified interest group 	<ul style="list-style-type: none"> *Conducts an investigation of a local issue *Presents a potential solution to a local issue based on research *Communicates solution a group of peers 	<ul style="list-style-type: none"> *Conducts an investigation of a local issue *Presents a potential solution to a local issue based on research
SC.SP.B.08.02	Researches how social, economic, and political forces strongly influence which technology will be developed and used	<ul style="list-style-type: none"> *Describes and illustrates how technology is influenced by social, economic and political forces *Identifies ways in which multiple factors influence technology used for the advancement of science *Researches two technological advancements which was prompted by a unique political, economic, or social force 	<ul style="list-style-type: none"> *Describes how technology is influenced by social, economic and political forces *Identifies ways in which multiple factors influence technology used for the advancement of science *Researches a technological advancement which was prompted by a unique political, economic, or social force 	<ul style="list-style-type: none"> *Describes how technology is influenced by social, economic and political forces *Researches a technological advancement which was prompted by a unique political, economic, or social force 	<ul style="list-style-type: none"> *Describes how technology is influenced by social, economic and political forces

SC.SP.B.09.02	Investigates the influences of societal and/or cultural beliefs on science	<ul style="list-style-type: none"> *Researches two present scientific issues which are influenced by societal and/or cultural beliefs *Researches a historical scientific issue which was influenced by societal and/or cultural beliefs *Describes three scientific advancements which have been hindered by societal and/or cultural beliefs 	<ul style="list-style-type: none"> *Researches a present scientific issue which is influenced by societal and/or cultural beliefs *Researches a historical scientific issue which was influenced by societal and/or cultural beliefs *Describes two scientific advancements which have been hindered by societal and/or cultural beliefs 	<ul style="list-style-type: none"> *Researches a present scientific issue which is influenced by societal and/or cultural beliefs *Describes a scientific advancement which has been hindered by societal and/or cultural beliefs 	<ul style="list-style-type: none"> *Researches a present scientific issue which is influenced by societal and/or cultural beliefs
SC.SP.B.10.02	Describes the importance of logical arguments in the advancement of scientific knowledge (i.e. thought experiments by Einstein, Hawking, Newton)	<ul style="list-style-type: none"> *Describes the role of philosophy in science *Describes the role of logic in scientific advancement *Investigates the parallels between mathematics and science *Presents thought experiments by influential scientists such as Einstein, Hawking, Newton, Galileo, etc, to a group of community members 	<ul style="list-style-type: none"> *Describes the role of philosophy in science *Describes the role of logic in scientific advancement *Investigates the parallels between mathematics and science *Presents thought experiments by influential scientists such as Einstein, Hawking, Newton, Galileo, etc, to a group of peers 	<ul style="list-style-type: none"> *Describes the role of philosophy in science *Describes the role of logic in scientific advancement *Investigates the parallels between mathematics and science 	<ul style="list-style-type: none"> *Describes the role of philosophy in science *Describes the role of logic in scientific advancement
SC.SP.B.11.02	Investigates instances when scientists' observations were not in accord with prevailing ideas of the time	<ul style="list-style-type: none"> *Describes five successful scientists who improved scientific knowledge and were criticized by the science community 	<ul style="list-style-type: none"> *Describes three successful scientists who improved scientific knowledge and were criticized by the science community 	<ul style="list-style-type: none"> *Describes one successful scientist who improved scientific knowledge and was criticized by the science community 	<ul style="list-style-type: none"> *Researches one scientist who improved scientific knowledge