EALR 1: Systems
Big Idea: Systems (SYS)
Core Content: *Predictability and Feedback*

Stimulus and Stem Rules

- A stimulus or stem will include an adequate description of an appropriate life science system.

Item Specifications

	Items may ask students to:	C.C.	Format
9-12 SYSA Feedback	(1) Describe feedback as a process in which the output of a given system provides information used to regulate the operation of the system.	2	MC
	(2) Determine whether a given system involves positive feedback or negative feedback.	2	MC CP
	(3) Describe the regulatory inputs and/or outputs of a given positive feedback system (e.g., after a cut, a clotting process cascades to form a scab; increased CO_2 and methane inputs results in higher temperatures, decreased light reflected to space, ice caps melting, and sea levels rising).	3	MC SA
	(4) Describe the regulatory inputs and/or outputs of a given negative feedback system (e.g., temperature increase in humans due to exercise, fever, too much sunlight, or increased cellular respiration results in evaporative cooling due to sweating).	3	MC SA
9-12 SYSB Systems Thinking	(1) Identify how a systems approach will be helpful in answering a given question or solving a given problem.	2	MC
	(2) Identify the components, boundaries, flows, and/or feedbacks of a given system.	2	MC
	(3) Describe one or more subsystem(s) and/or the larger system that contains a given system.	2	MC
	(4) Describe how a given system functions with respect to other systems.	3	MC SA
9-12 SYSC Modeling Complex Systems	(1) Given a model of a complex system that is lacking sufficient detail to make reliable predictions about that system, describe inadequacies of the model.	3	MC SA
	(2) Predict the possible consequences of a change in a given complex system and/or describe why a simplified model may not be able to reliably predict those consequences.	3	MC SA
	Classroom only: Create a simplified model of a complex system. Trace the possible consequences of a change in one part of the system and explain how the simplified model may not be adequate to reliably predict consequences.	NA	NA
9-12 SYSD Equilibrium	(1) Identify whether a given system is changing or in equilibrium.	2	MC
	(2) Determine whether a state of equilibrium in a given system is static (i.e., the net force on all particles is zero) or dynamic (i.e., inflows equal outflows).	2	MC

Key: ***Format***= Multiple-Choice (MC), Completion (CP), Short-Answer (SA), or Not Assessed (NA)
C.C.= Cognitive Complexity (#) = Cognitive Complexity for items

EALR 2: Inquiry

Big Idea: **Inquiry (INQ)**

Core Content: *Conducting Analyses and Thinking Logically*

Stimulus and Stem Rules

- A stimulus or stem will include an adequate description of an appropriate life science system or investigation.

Item Specifications

	Items may ask students to:	C.C.	Format
9-12 INQA Questions	Classroom only: Generate questions that could be investigated scientifically.	NA	NA
	(1) Explain whether a given question can be investigated scientifically.	2	MC
	(2) Critique question(s) in terms of whether investigating the question will provide evidence for a given prediction or hypothesis.	2	MC
9-12 INQB Plan an Investigation	(1) Describe a plan to answer a given question for a controlled experiment with the following attributes: • At least two controlled variables • One manipulated (independent) variable with three or more conditions • One responding (dependent) variable • Experimental control condition, when appropriate • Additional validity measure • Data to be gathered and recorded from multiple trials • Logical steps	3	SA
	(2) Describe a plan to answer a given question for a field study with the following attributes: • Method for collecting data (controlled variable) • Conditions to be compared (independent/manipulated variable) • Data to be collected (dependent/responding variable) • Data to be gathered and recorded from multiple observations • Environmental conditions recorded • Logical steps	3	SA
	(3) Describe an appropriate type of investigation for a given investigative question (e.g., field study, systematic observation, controlled experiment, model, or simulation).	2	MC
	(4) Describe a plan for a scientific investigation using a model, simulation, or systematic observation.	3	MC
	Classroom only: Conduct a scientific investigation, choosing a method appropriate to the question being asked.	NA	NA
	Classroom only: Collect, analyze, and display data using calculators, computers, or other technical devices when available.	NA	NA

Key: ***Format***= Multiple-Choice (MC), Completion (CP), Short-Answer (SA), or Not Assessed (NA)
C.C.= Cognitive Complexity (#) = Cognitive Complexity for items

	Items may ask students to:	C.C.	Format
9-12 INQC Conclusions from Data	(1) Generate a logical conclusion that is supported by evidence from the investigation and/or provide a scientific reason to explain the trend in data given a description of and the results from a scientific investigation.	3	MC SA
	(2) Analyze multiple explanations for a given set of data and identify the explanation that best fits the data.	2	MC
9-12 INQD Reports	Assessed in INQB and Classroom: Write a detailed laboratory report that includes: the question that motivated the study, a justification for the kind of investigation chosen, hypotheses (if any), a description of what was done, a summary of data in tables and graphs, and a conclusion, based on the evidence, that responds to the question.	NA	NA
9-12 INQE Model and Theory	(1) Identify a testable prediction or hypothesis that can be generated from a given model, theory, or new condition in an existing model.	2	MC
	(2) Explain how scientific inquiry results in the development of a theory or conceptual model that can generate testable predictions or hypotheses.	2	MC
9-12 INQF Analyze an Investigation	(1) Evaluate an investigation in terms of validity (e.g., answered the investigative question with confidence; the manipulated variable caused the change in the responding variable).	2	MC SA
	(2) Evaluate an investigation in terms of reliability (e.g., reliability means that repeating an investigation gives similar results).	2	MC SA
	(3) Describe how to increase the reliability of the results of an investigation (e.g., repeating the investigation exactly the same way increases the reliability of the results).	2	MC SA
	(4) Describe how to improve the validity of an investigation (e.g., more controlled variables, better measuring technique, control for sample bias, include experimental control condition or a placebo group when appropriate).	2	MC SA
	(5) Describe the development of scientific theories through logical reasoning, creativity, testing, revision, and replacement of prior ideas in light of new evidence.	2	MC
	(6) Describe new evidence that can lead to scientists revising a theory.	2	MC
9-12 INQG Communicate Clearly	(1) Explain inconsistencies in findings from a given investigation.	3	MC SA
	Classroom only: Participate in a scientific discussion about their own investigations and those performed by others.	NA	NA
	Classroom only: Respond to questions and criticisms, and if appropriate, revise explanations based on these discussions.	NA	NA
9-12 INQH Sources of Information	(1) Explain that scientists evaluate sources of information to establish reliability before using the information.	2	MC SA
	(2) Evaluate or compare source(s) of information in terms of their reliability.	3	MC SA
	(3) Explain why honest acknowledgment of the contributions of others and/or information sources is necessary (e.g., undocumented sources of information prevents the verification of data and undermines the credibility of explanations and investigations).	2	MC

Key: ***Format***= Multiple-Choice (MC), Completion (CP), Short-Answer (SA), or Not Assessed (NA)
C.C.= Cognitive Complexity **(#)** = Cognitive Complexity for items

EALR 3: Application

Big Idea: Application (APP)

Core Content: *Science, Technology, and Society*

Stimulus and Stem Rules

- A stimulus or stem will include an adequate description of an appropriate life science system or technological design process.

Item Specifications

	Items may ask students to:	C.C.	Format
9-12 APPA Science and Society	Classroom only: Describe ways scientific ideas have influenced society or the development of differing cultures	NA	NA
	(1) Describe how science and/or technology might address a societal or cultural issue and/or how society affects science (e.g., funding research, views on what is important to study).	3	MC SA
	(2) Identify a question that scientists may investigate that is stimulated by the needs of society (e.g., medical research, global climate change).	3	MC
9-12 APPB Solutions, Research, & Criteria for Success	(1) Describe criteria that would be used to evaluate potential solutions and/or describe constraints (i.e., limitations) on potential solutions given a description of a problem that can be solved using a technological design process.	3	MC SA
	(2) Describe research that would facilitate a solution to the problem and/or generate several possible solutions given a description of a problem that can be solved using a technological design process.	3	MC SA
9-12 APPC Choosing a Solution	(1) Evaluate the solution(s) with respect to criteria on which to judge success and/or constraints (i.e., limitations) on the solution(s) given one or more solution(s) to a problem that can be solved using a technological design process.	3	MC SA
	(2) Describe a method for testing the solution(s) given a problem that can be solved using a technological design process and possible solution(s).	3	MC SA
	(3) Describe a redesign of a solution given a solution to a technological design problem and the results of a test of that solution.	3	MC SA
9-12 APPD Math and Technology	Assessed in Mathematics: Use proportional reasoning, functions, graphing, and estimation to solve problems.	NA	NA
	Classroom only: Use computers, probes, and software when available to collect, display, and analyze data.	NA	NA
9-12 APPE Trade-offs and Consequences	(1) Describe trade-offs and/or unintended consequences for one or more given solution(s) to a given technological design problem.	3	MC SA
9-12 APPF Informed Citizens	Classroom only: Critically analyze scientific information in current events to make personal choices or to understand public-policy decisions.	NA	NA

Key: ***Format***= Multiple-Choice (MC), Completion (CP), Short-Answer (SA), or Not Assessed (NA)
C.C.= Cognitive Complexity (#) = Cognitive Complexity for items

EALR 4: Life Science

Big Idea: **Structures and Functions of Living Organisms (LS1)**

Core Content: *Processes Within Cells*

Stimulus and Stem Rules

- A stimulus or stem will include an adequate description of an appropriate life science system.

Item Specifications

	Items may ask students to:	C.C.	Format
9-11 LS1A Matter and Energy in Photosynthesis	(1) Identify inputs and/or outputs of matter and/or energy in photosynthesis using words and/or chemical formulas (i.e., inputs are carbon dioxide/CO_2, water/H_20, light energy; outputs include glucose/$C_6H_{12}O_6$, oxygen/O_2).	2	MC CP
	(2) Describe the rearrangement of atoms during photosynthesis using the chemical equation for photosynthesis.	2	MC
	(3) Explain the role of photosynthesis in the life of plants (e.g., photosynthesis is the only source of glucose that provides chemical energy or is incorporated into large molecules). **Note:** On the science assessments, the term 'mineral nutrient' will be used to describe the matter plants generally get from soil. Mineral nutrients are not food for plants. Plants make their food (energy-rich molecules) with light energy and matter from air, water, and mineral nutrients.	2	MC
	(4) Explain the role of photosynthesis in the life of animals (e.g., photosynthesis is the source of the chemical energy animals require to live and grow; photosynthesis provides oxygen).	2	MC
9-11 LS1B Cellular Respiration	(1) Describe cellular respiration as the process cells use to change the energy of glucose into energy in the form of ATP and/or the process that provides the energy source for most living organisms.	2	MC
	(2) Compare cellular respiration to the burning of fossil fuels (e.g., large carbon-containing compounds are broken into smaller carbon compounds as chemical energy is transformed to different forms of energy in both cellular respiration and combustion of fossil fuels).	2	MC CP
	(3) Describe the inputs and/or outputs of matter and/or energy in cellular respiration and/or in combustion (i.e., inputs include glucose or large carbohydrates and oxygen, outputs include carbon dioxide, water, and energy/ATP).	2	MC CP SA
9-11 LS1C Function of Organelles	(1) Describe the essential function(s) of structures within cells (i.e., cellular membrane, cell wall, nucleus, chromosome, chloroplast, mitochondrion, ribosome, cytoplasm).	2	MC CP
9-11 LS1D Cell Membrane	(1) Describe the structure of the cell membrane as a bilayer with embedded proteins capable of regulating the flow of materials into and out of the cell.	2	MC
	(2) Describe the process(es) (i.e., active transport, passive transport, osmosis, facilitated diffusion) that allows substances to pass through the cell membrane.	2	MC CP SA

Key: ***Format***= Multiple-Choice (MC), Completion (CP), Short-Answer (SA), or Not Assessed (NA)
C.C.= Cognitive Complexity **(#)** = Cognitive Complexity for Items

	Items may ask students to:	C.C.	Format
9-11 LS1E DNA, Genes, and Protein Synthesis	(1) Describe the structure of DNA molecules in terms of the four nucleotides (i.e., A, C, G, and T subunits are combined in various sequences).	1	MC CP
	(2) Describe that the sequence of the four nucleotides in the DNA molecule encodes genetic information.	1	MC
	(3) Describe the relationships among DNA, chromosomes, genes, amino acids, proteins, and/or traits.	1	MC
	(4) Describe that the sequence of the nucleotides in a gene specifies the amino acids needed to make a protein.	1	MC
	(5) Describe inherited traits (e.g., eye color, hair texture, attached earlobes, tongue rolling) and cell functions as primarily determined by the proteins expressed by genes.	1	MC
	(6) Predict the complementary strand of mRNA given the nucleotide sequence in a single strand of DNA.	2	MC CP
	(7) Describe the steps and/or structures in the process by which gene sequences are copied to produce proteins (e.g., the sequence of nucleotides in DNA determines the sequence of subunits in mRNA assembled in the nucleus, and the mRNA is held by ribosomes in the cytoplasm where amino acids carried by tRNA are assembled into proteins based on the codons in the mRNA sequence).	2	MC SA
9-11 LS1F Chemical Reactions in Cells	(1) Describe that large molecules in food are broken down into smaller molecules by cells to provide energy or building blocks (i.e., proteins into amino acids, carbohydrates into simple sugars, fats into fatty acids, DNA into nucleotides).	2	MC
	(2) Describe that cells build large molecules required for cell functions from smaller molecules (i.e., proteins from amino acids, carbohydrates from simple sugars, fats from fatty acids, DNA from nucleotides).	2	MC
	(3) Describe enzymes as proteins that regulate reactions that break down and/or build molecules needed by cell structures and/or functions.	1	MC
	(4) Describe that cells transfer chemical energy from food to special molecules (i.e., ATP, fat, carbohydrates) through a process that involves enzymes, to be used later by the cell.	1	MC
	(5) Describe that chemical energy stored in special molecules (i.e., ATP, fat, carbohydrate) is used by cells to drive cell processes.	1	MC
9-11 LS1G Enzymes and Other Proteins	(1) Describe that cells use DNA that forms their genes to encode enzymes and other proteins.	1	MC
	(2) Describe that cell functions (e.g., cell growth and division, response to the environment) can be regulated by changing the activity of proteins and/or by changing whether and how often particular genes are expressed.	2	MC
	(3) Describe that changes in the environment can cause changes in the amount and/or activity of proteins (e.g., enzymes) produced by a gene.	2	MC

Key: ***Format***= Multiple-Choice (MC), Completion (CP), Short-Answer (SA), or Not Assessed (NA)
C.C.= Cognitive Complexity **(#)** = Cognitive Complexity for Items

	Items may ask students to:	C.C.	Format
9-11 LS1H Chromosomes and Mitosis	(1) Describe that genes are carried on chromosomes.	1	MC CP
	(2) Describe that typical animal cells contain two copies of each chromosome, one from each biological parent, with genetic information that regulates body structure and function.	2	MC
	(3) Describe the process of mitosis (e.g., the genetic information is copied and each of two new cells receives exact copies of the original chromosomes) and/or the product of mitosis (e.g., two cells each with the same number of chromosomes as the original cell).	2	MC CP
9-11 LS1I Meiosis, Fertilization, and Offspring Variation	(1) Describe the process of meiosis (e.g., each egg or sperm cell receives only one representative chromosome from each pair of chromosomes found in the original cell) and/or product of meiosis (e.g., egg and sperm cells with only one set of chromosomes).	2	MC CP
	(2) Describe that the processes of recombination during meiosis (e.g., segregation, independent assortment) result in a unique combination of genetic information in the egg or sperm cell.	2	MC SA
	(3) Describe the relationship between the unique combination of genetic information in an egg or sperm cell and the differing characteristics in offspring from a single set of parents.	2	MC
	(4) Describe the process of fertilization as restoring the original chromosome number (e.g., an egg and sperm, each with half the number of chromosomes of the original cell, combine to restore the number of chromosomes from the original cell).	2	MC CP
	(5) Describe that the process of fertilization allows for variation among offspring from a single set of parents.	2	MC
	(6) Describe possible allele combinations in an egg or sperm cell given a combination of two traits and a parent's genotype for the two traits.	2	MC CP
	(7) Describe the possible combinations of offspring in a simple Mendelian genetic cross for two traits (e.g., given a Punnett square for two traits, fill in one missing cell).	2	MC CP
	(8) Describe the possible combinations of offspring in a genetic cross involving codominance or incomplete dominance for a single trait.	2	MC CP

EALR 4: Life Science

Big Idea: **Ecosystems (LS2)**

Core Content: *Maintenance and Stability of Populations*

Stimulus and Stem Rules

- A stimulus or stem will include an adequate description of an appropriate life science system.

Item Specifications

	Items may ask students to:	C.C.	Format
9-11 LS2A Transfers and Cycles of Matter and Energy	(1) Describe the cycle of carbon through ecosystems (e.g., carbon dioxide in air becomes large carbon-containing molecules in the tissues of plants through photosynthesis, these molecules can be cycled to animals that consume the plants, then returned as carbon dioxide to the atmosphere through cellular respiration, combustion, and decomposition).	2	MC CP SA
	(2) Describe examples of matter cycling that can affect the health of an ecosystem (e.g., composting to improve soil quality, crop rotation, worm bins, fertilizer runoff, bioaccumulation).	2	MC
	(3) Describe the cycle of nitrogen through ecosystems (e.g., nitrogen in air is taken in by bacteria in soil, then made directly available to plants through the soil, and returned to the soil and atmosphere when the plants decompose).	2	MC CP
	(4) Describe the transfers and transformations of matter and/or energy in an ecosystem (e.g., sunlight transforms to chemical energy during photosynthesis, chemical energy and matter are transferred when animals eat plants or other animals, carbon dioxide produced by animals by respiration is used by plants and transformed to glucose during photosynthesis).	2	MC SA
9-11 LS2B Population Density	(1) Describe conditions necessary for populations to increase rapidly (e.g., adequate living and nonliving resources, no disease or predators).	2	MC
	(2) Describe population density and/or the factors that affect population density.	2	MC
	(3) Calculate population density given an area and the number of a given organism within the area.	2	MC CP
9-11 LS2C Limiting Factors	(1) Describe factors that limit growth of plant and/or animal populations in a natural ecosystem.	2	MC SA
	(2) Explain how a change to a factor (e.g., matter, energy, space, predatory, or competing organisms) would limit the population of a species.	2	MC

Key: ***Format***= Multiple-Choice (MC), Completion (CP), Short-Answer (SA), or Not Assessed (NA)
C.C.= Cognitive Complexity **(#)** = Cognitive Complexity for items

	Items may ask students to:	C.C.	Format
9-11 LS2D Population Graphs	(1) Predict the changes in the population size of a species given a quantitative description of an ecosystem (e.g., predator-prey graph; J-curve of carrying capacity of ecosystem; available range vs. population size graph).	2	MC
	Classroom only: Draw a systems diagram to illustrate and explain why introduced (nonnative) species often do poorly and have a tendency to die out, as well as why they sometimes do very well and force out native species.	NA	NA
9-11 LS2E Biodiversity	(1) Given a description of the biodiversity in two ecosystems, identify reasons for differences in biodiversity.	2	MC
	(2) Describe interrelationships of organisms that affect the stability of populations in a given ecosystem (e.g., nutrient cycles, food relationships, use of resources and succession).	2	MC
	(3) Describe that biodiversity contributes to the stability of an ecosystem.	2	MC
9-11 LS2F Sustainability	(1) Explain scientific concepts and/or findings that relate to a given resource issue (e.g., removal of dams to facilitate salmon spawning in rivers; construction of wind farms; recycling).	2	MC SA
	(2) Describe how sustainable development could help with a current resource issue (e.g., using renewable rather than nonrenewable resources, using recycled resources).	2	MC SA

EALR 4: Life Science

Big Idea: **Biological Evolution (LS3)**

Core Content: *Mechanisms of Evolution*

Stimulus and Stem Rules

- A stimulus or stem will include an adequate description of an appropriate life science system.

Item Specifications

	Items may ask students to:	C.C.	Format
9-11 LS3A Natural Selection	(1) Describe the genetic variability of offspring due to mutations and genetic recombination as allowing some offspring to be better able to survive and produce offspring.	2	MC SA
	(2) Describe that some traits will improve an individual's survival rates and subsequent reproduction in environments with a finite supply of resources.	2	MC
	(3) Explain biological evolution as the consequence of the interaction of population growth, inherited variability of offspring, a finite supply of resources, and/or natural selection by the environment of offspring better able to survive and reproduce.	2	MC SA
	(4) Describe how environmental pressure on a population drives natural selection (e.g., warming climate causes extinction of species not able to adapt).	2	MC
	(5) Predict the effect on a population of a given change in inherited variability of offspring, potential for population growth, resources, and/or environmental pressure (e.g., decreased variation in alleles).	2	MC
9-11 LS3B Mutations	(1) Describe mutations as random changes or occasional mistakes in the copying of genetic material that, when in egg or sperm cells, can be inherited by future generations.	2	MC
	(2) Describe the molecular processes and/or environmental factors by which mutations can occur (e.g., insertion, deletion, substitution, or UV radiation in sunlight).	2	MC
	(3) Describe that changes caused by mutations will often be harmful, but a small minority of mutations will cause changes that allow the offspring to survive longer and reproduce more.	2	MC
	(4) Predict how a given trait or mutation will allow a species to survive and reproduce in a given environment.	2	MC SA
9-11 LS3C Species Diversification	(1) Explain that species alive today have diverged from a common ancestor (e.g., by interpreting diagram representing an evolutionary tree).	2	MC
	(2) Explain how filling an available niche can allow a species to survive.	2	MC
	(3) Describe that genes in very different organisms can be similar because the organisms all share a common ancestor.	2	MC

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C.C.= Cognitive Complexity (#) = Cognitive Complexity for items

	Items may ask students to:	C.C.	Format
9-11 LS3D Evidence of Evolution	(1) Explain how the fossil record, anatomical similarities, and/or molecular (DNA) similarities can be used as evidence for the evolutionary development of a given species (e.g., birds, horses, elephants, whales).	2	MC
9-11 LS3E Relatedness of Organisms	(1) Describe that scientists infer the degree of evolutionary relationship among organisms using physiological traits, genetic information, and/or the ability of two organisms to produce fertile offspring.	2	MC
	(2) Describe relationship(s) among organisms based on similarities and/or differences in physical and/or functional characteristics.	2	MC
	(3) Describe the similarities and/or differences (i.e., embryology, homology, analogous structures, genetic sequences) of given organisms in terms of biological evolution (e.g., Darwin's finches had different beaks due to food sources on the islands where they evolved).	2	MC
	(4) Describe the evolutionary relationship between two organisms and/or identify the organisms that are most closely related given a diagram representing an evolutionary tree.	2	MC

Science Vocabulary Used in Assessment Items

Items on the biology end-of-course exam use language targeted to an eighth grade or lower readability with the exception of the required biology terms in the following list. Appropriate science vocabulary allowed for all earlier grade level science assessments may also be used on the biology end-of-course exam. Example vocabulary from life science in earlier grade levels is also included in the following list.

a

Used in grade 8:
accuracy
acquired (learned) characteristic
adaptation
asexual reproduction
atom

Used in Biology:
absorption
active transport
allele
amino acid
atmospheric
ATP
aquatic

b

Used in grade 8:
boundary

Used in Biology:
bacteria
bacterium
bi-layer
biodiversity
biomass

c

Used in grade 5:
characteristic
classify
conclude
conclusion
conserve
consumer
controlled experiment
cycle

Used in grade 8:
cell membrane
cell nucleus
cell wall
chemical energy
chemical reaction
chloroplast
chromosomes
circulatory system
closed system
compound

Used in Biology:
carbon cycle
carbon dioxide
carbohydrates
cellular respiration
chlorophyll
combustion
complementary
computer simulation
concentration
constraint
contraction
criteria
cytoplasm

d

Used in grade 5:
data
decomposer
dissolve

Used in grade 8:
digestive system
dominant

Used in Biology:
diffusion
divergent
diversity
DNA

e

Used in grade 5:
ecosystem
energy
environment
evidence
experimental question
extinct

Used in grade 8:
effective
element
evolution

Used in Biology:
embryo
endangered
endocrine system
energy chain
enzyme
equilibrium
estuary
expansion
experimental control condition

f

Used in grade 5:
field study
food web
form of energy
fossil
function

Used in grade 8:
factor
filter

Used in Biology:
facilitated diffusion
fatty acids
finite
fossil fuels
fungus

g

Used in grade 8:
gene
genetic
glucose

Used in Biology:
gender
gene pool
genetic cross
genetic recombination
genotype
glucose

h

Used in grade 5:
habitat

Used in Biology:
heterozygous
homozygous
honesty
hormone
host
hydrosphere

i

Used in grade 5:
inherited
input
investigation

Used in grade 8:
impact
infer

Used in Biology:
invasive

k

Used in grade 8:
kinetic energy

l

Used in grade 5:
light energy

Used in Biology:
lipid bi-layer

m

Used in grade 8:
mitochondria
mitochondrion
molecule

Used in Biology:
mammals
meiosis
microorganism
mitosis
mRNA
mutate
mutation

n

Used in Biology:
native
natural selection
negative feedback
neurological system
niche
nitrogen cycle
non-native
nonrenewable
nucleic acid
nucleotides

o

Used in grade 5:
organism
output

Used in grade 8:
offspring
open system

Used in Biology:
organelle
osmosis
ova
ozone

p

Used in grade 5:
particle
pollution
population
predator
predict
prediction
procedure
producer

Used in grade 8:
particles
photosynthesis
prey

Used in Biology:
parasite
passive transport
pesticide
pH
phenotype
photosynthesize
pistil
pollinator
population density
positive feedback
principle
protein

r

Used in grade 5:
recycle
redesign
reliable
resource

Used in grade 8:
recessive
respiratory system
ribosome

Used in Biology:
regulate
reliability
renewable
reproduce
research question

s

Used in grade 5:
structure
subsystem
summary
survive

Used in grade 8:
sexual reproduction
skeletal system
soluble
species

Used in Biology:
sensor
skeptical
solubility
solution (aqueous)
species
sperm
spherical
spinal cord
spore
stamen
succession
sustainability
systematic observation

t

Used in grade 5:
technology
texture
thermometer
transform
transformation

Used in grade 8:
thermal (heat) energy
tissue

Used in Biology:
theory
toxin
trade-off
trait
transmission
trend
tRNA

u

Used in Biology:
unintended consequence

v

Used in grade 5:
variable
versus (vs.)

Used in grade 8:
valid

Used in Biology:
vacuole
validate
validity
virus